R E P O R T   R E S U M E S

ED 002 907   24

THE EFFICACY OF SPECIAL CLASS TRAINING ON THE DEVELOPMENT OF MENTALLY RETARDED CHILDREN.

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REPORT NUMBER CRP-619   PUB DATE   65
EDRS PRICE   MF-$0.36   HC-$9.88   247P.

DESCRIPTORS- *RETARDED CHILDREN, *MENTAL RETARDATION, *SPECIAL CLASSES, TRAINING, *CHILD DEVELOPMENT, ACADEMIC ACHIEVEMENT, INTELLECTUAL DEVELOPMENT, SOCIAL ADJUSTMENT, PERSONAL ADJUSTMENT, *EDUCABLE MENTALLY HANDICAPPED, COMPARATIVE ANALYSIS, URBANA, ILLINOIS

THE INTELLECTUAL DEVELOPMENT, ACADEMIC ACHIEVEMENT, AND SOCIAL AND PERSONAL ADJUSTMENT OF EDUCABLE MENTALLY RETARDED CHILDREN ENROLLED IN SPECIAL CLASSES WERE COMPARED TO THOSE OF PEERS IN REGULAR GRADES. ABOUT 125 CHILDREN, BEGINNING FIRST GRADE AND HAVING A MEAN IQ OF 75 (STANFORD-BINET SCALE), WERE DIVIDED RANDOMLY INTO AN EXPERIMENTAL GROUP AND A CONTROL GROUP. A SERIES OF INTELLECTUAL, ACADEMIC, AND PERSONAL ADJUSTMENT MEASURES WAS ADMINISTED TO ALL THE CHILDREN ANNUALLY FOR 4 YEARS. DURING THIS PERIOD AN ATTRITION OF ABOUT THREE-FOURTHS OF THE ORIGINAL SAMPLE TOOK PLACE. THIS, HOWEVER, DID NOT SIGNIFICANTLY AFFECT THE STUDY RESULTS. THERE WERE NO STATISTICALLY SIGNIFICANT DIFFERENCES IN IQ GAINS BETWEEN THE SPECIAL CLASSES GROUP AND THE REGULAR GRADES GROUP, AND SEVERAL SOCIAL FACTORS WERE FOUND TO BE RELATED TO INCREASES IN IQ. THE ANALYSIS OF ACADEMIC ACHIEVEMENT INDICATED THAT THE SPECIAL CLASS IS BENEFICIAL TO CHILDREN WHOSE IQ'S ARE 80 AND BELOW, BUT THAT IT IS NOT NECESSARILY AN EFFECTIVE EDUCATIONAL SETTING FOR SIGNIFICANTLY IMPROVING ACADEMIC ACHIEVEMENT OF CHILDREN USUALLY CLASSIFIED AS BORDERLINE OR SLOW LEARNERS, WHO HAVE IQ'S ABOVE 80. FINDINGS ON PERSONAL ADJUSTMENT SHOWED THAT SPECIAL CLASSES ENCOURAGED THE RETARDATES TO DISPLAY ORIGINALITY AND FLEXIBILITY IN THEIR THINKING. (JH)

EP00290

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The Efficacy of Special Class Training on the Development of Mentally Retarded Children

Cooperative Research Project No. 619

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1965

The research reported herein was supported by the Cooperative Research Program of the Office of Education, U. S. Department of Health, Education and Welfare.

FOREWORD

The study reported in this manuscript is one of a series of research studies on the educability of young mentally retarded children conducted at the Institute for Research on Exceptional Children. A study by Gallagher (1960) on The Tutoring of Brain-Injured Children demonstrated the trainability of institutionalized children. Another, by Kirk (1958), on The Early Education of the Mentally Retarded showed that preschool education accelerates the rate of development of both institutionalized and community children. The community group whose education was initiated at age four and one-half increased in Binet IQ by 11 points by the age of six, while a contrast group who did not attend preschool in the community showed no increase in IQ during this age period. The latter group, however, increased their Binet IQ by 6 points by age 7 after one year of school in the special class or first grade, while the former (experimental groups) did not continue their increase in rate of development, but did maintain their increase.

The present study is a continuation of the preschool study. Its purpose was to determine whether school at the age of six would accelerate the rate of mental development as it did at age four and one-half, and to compare the rate of progress of mentally retarded children assigned to special classes and those remaining in the regular grades in mental, social and academic achievement.

Previous studies which compared special class with regular class placement suffered from the major deficiencies of in situ research, including children admitted to the special class after several years of failure in school, no control of the selection factor, and lack of other controls. These studies have indicated that children retained in the regular grades achieve academically at a higher level than those enrolled in special classes. Some of the studies, however, indicated that social adjustment is positively affected by special class placement.

The present study, which was controlled for the selection factor and which initiated the program for both experimental and control subjects at age six, indicates that school experiences, whether in the special class or in the regular grades, increased the IQ seven to eight points during the first year of school. The conclusion of the present study that schooling at age six tends to elevate the IQ of these children is of major significance, but when compared to the preschool study the increases in IQ were not as great as those whose schooling was initiated at the average age of four and one-half. When we compare these studies with the Skeels & Dye (1939) study where the IQ's increased approximately 26 points (when environmental intervention was initiated at ages one and two) one can hypothesize that although age six is not too late for some gains early intervention is more effective.

Contrary to the results of previous studies the academic achievement of the two groups in the present investigation does not show the special class children to be inferior to those in regular grades. Actually, for those below 80 IQ the results tended to be in favor of the special class, but not to the extent that this alone would justify special class organization. An interesting finding, however, is that children with higher IQ's (above 80) should not be placed in special classes. This finding could be interpreted to mean that a child will tend to regress to the mean of his group, and that it may be detrimental for a child with an IQ of 80 to 90 to be placed in a class where the mean IQ is 65 to 75. Many such children who have other handicaps such as behavior problems or learning disabilities are placed in classes for the retarded because it is believed that, since they are not adjusting in the regular grades, they would be better off in the special class.

Most of the studies, including this one, are in agreement that the special class is beneficial to personality development and social adjustment. One major reason for the organization of special classes is for mental health purposes. In such classes pressure for academic achievement is more realistic and greater emphasis is placed on personality adjustment. In this effort the special class has been relatively successful.

The methodology used in this study and the results should tend to obviate the necessity for further studies which compare the gross progress of mentally retarded children in special classes with that of similar children remaining in regular grades. A more fruitful area for research may be found in the investigation of the processes by which mentally retarded children can develop mentally, socially, and academically.

One would be remiss in not pointing out some factors involved in the logistics or management of longitudinal research.

First, the project from its design stage to its completion received the assistance of the Institute staff of sociologists, psychologists, and experimental special educationists not on the project staff.

Secondly, a longitudinal program of research suffers from attrition of both subjects and staff. As indicated in the text, the loss of subjects was approximately 25 percent over a four-year period. Only one teacher remained in the program for more than a two-year period. In addition, the experimental staff suffered similar attrition. Dr. Herbert Goldstein accepted the Chairmanship of the Department of Special Education at Yeshiva University during the third year of the project. Dr. James Moss, who was responsible for the examination of the children and the analysis of the results, left during the fourth year of the project to become Director, Research and Demonstration Branch, Division of Handicapped Children and Youth, U. S. Office of Education. Both Dr. Goldstein and Dr. Moss, however, remained as consultants to the Director of the Institute on the project. Dr. Laura Jordan remained on the project from the beginning to its completion.

Dr. Herbert Goldstein was responsible for organizing the project, soliciting the cooperation of school boards and superintendents, organizing and supervising the educational program, employing personnel, and assisting with the analysis of the data and the preparation of the manuscript. Dr. James Moss was responsible for the supervision of the retest program, for the research on personality, for the analysis of the data on results, and for preparing the chapters on results. Dr. Laura Jordan supervised the educational programs, gave in-service training to the teachers, and prepared the manuscript on the educational program.

Samuel A. Kirk
Director

ACKNOWLEDGEMENTS

The conduct of a longitudinal research project involving as many facets as this one did incurs indebtedness to more individuals than can easily be listed. Such a study could not have been conducted without the wholehearted cooperation of the administrators of the three participating counties. The school boards of these districts were gracious enough to permit experimental research in their schools. The project owes a deep debt of gratitude to the four cooperating superintendents, Mr. Donald Buskirk, Superintendent of Westville Community Consolidated Schools, Mr. Walter Knecht, Superintendent of the Kankakee Public Schools, Mr. Warren Page, Superintendent of the Gibson City Community Unit School District, and Mr. A. J. McKinney, Ford County Superintendent of Schools, all of whom made material sacrifices in operating funds and school organization to make this project possible.

Appreciation is expressed to Miss Helen Appledoorn who supervised the initial psychological testing, to Mr. Raymond Cottrell for statistical analysis at the completion of the study, to Dr. Joseph Meyerowitz (employed during the first two years of the project) who was responsible for gathering the data on family organization, and to numerous graduate assistants and the ten project teachers.

Professor Bernard Farber, research sociologist in the Institute, served as a consultant to the project on all sociological aspects of the study, and in addition prepared the final manuscript on the family studies, as well as critically evaluating and editing the final manuscript. The project is also indebted to Professor James J. Gallagher who supervised some of the individual studies and offered perceptive criticisms of the manuscript.

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INTRODUCTION

The first provisions for treatment of the mentally retarded in the United States were developed by Dr. Samuel H. G. Howe (1857) in the mid-1850's. Dr. Howe's concept was that of the residential training center for the retarded. It gained in popularity and was adopted by many states. Facilities were generally administered by the state welfare authorities. Almost fifty years later, the first public school special class was opened.

In the years that followed, the number of educable mentally retarded children enrolled in special classes increased slowly but steadily. There were 23,000 mentally retarded children enrolled in such classes by 1922 and 87,000 by 1948 (Martens & Harris, 1948, p. 10). After 1948, the rate of enrollment increased so that 218,000 retardates were in special classes by 1958 (Walker & Grant, 1962, p. 24). By 1963, there were 324,000 children in special classes (LaCrosse, 1964).

Many factors were responsible for the acceleration in special class placements in the years following World War II. These factors include (a) greater public interest as shown by increased community financial support, (b) an increase in parental interest and the involvement of parent groups in the promotion of special classes, and (c) an increase in state and federal government financial support and guidance to local school districts.

The movement to develop special classes for the mentally retarded in public schools was initiated around 1900. It was assumed that the educational setting, as part of the social environment of the child, influences the rate and nature of intellectual development. This idea persisted despite the fact that prevalent at the time was the conflicting belief that degree of intelligence was fixed at birth. At the beginning of the twentieth century Darwin's (1859) doctrine of heredity and Galton's (1869) theory of intellectual inheritance were growing in popularity. Yet at the same time both Seguin (1846) and Howe (1857) held that intelligence was amenable to change through educational practices.

The special-class movement in education was impeded for many years in the face of the impressive naturistic writings of Galton, his student J. McK. Cattell (1890), and Goddard (1912). Impetus was given for the establishment of special classes for the retarded by the work of Alfred Binet (1909). Binet contended that the conception that intellectual development was hereditarily determined was pessimistic. He likened the child's mind to a dormant field ministered to by the expert farmer and said, "It is in this particular sense, the one which is significant, that we say that the intelligence of children may be increased. One increases that which constitutes the intelligence of a school child, namely, the capacity to learn, to improve with instruction (Binet, 1909, p. 146)." The Binet-Simon test of intelligence made possible an objective assessment of those aspects of intelligence which might be affected by experience. This test facilitated the study of the educability of intelligence.

Probably the most convincing work supporting the hypothesis that differences in experience affect intelligence are the studies of children in orphanages and in nursery schools. The Iowa studies reported by Skeels & Dye (1939) and the study by Spitz (1945) demonstrated the considerable influence of early environmental conditions upon the development of intelligence. In the Iowa orphanages studies, for example, one group of children (aged seven months to two and one-half years) was removed to an institution for the retarded and placed in the care of older retarded girls, while a control group was left in the orphanage. After a period of intensive training in an institution, ranging from six months to over four years, the institutional group had gained from 7 to 58 IQ points (mean gain, 27.5 IQ points), while the orphanage group lost from 8 to 45 IQ points (mean loss, 26.2 IQ points).

These studies have faced serious criticism on the basis of test reliability (Goodenough, 1939), statistical treatment of the data (McNemar, 1940), and possible regression toward the mean (Hunt, 1961). Responses to these criticisms (Bayley, 1940; Wellman, Skeels, & Skodak, 1940) have helped to keep the nurturist argument viable and have provided data in support of the argument that relevant educational treatment might alter positively the development of mentally retarded children. The studies have also provided a model for testing the merits of the argument.

Previous Studies

Various investigations have been undertaken to determine the effectiveness of special classes for educable mentally handicapped children. These studies have been reviewed by Kirk in Stevens & Heber (1964). A brief summary of these investigations is presented in the following sections.

When the efficacy of special classes for the educable mentally retarded is compared with that of regular classes, it is important to recognize that both have in common an important array of goals, activities, and educational experiences. These conditions need to be taken into account in the following discussion of the research focusing on the efficacy of special classes.

The criteria against which efficacy has been measured vary with (a) the orientation of the investigator, (b) the composition of the samples, and (c) the conditions within which the research took place as dictated by time and setting. These factors limit the comparability of past and present studies. At the present time the consensus among educators is that the three major contributions of the special class are in the areas of intellectual, academic, and social and personality development. Earlier studies tended to focus on academic performance with less attention given to changes in intelligence and/or social and personality factors. For these reasons, previous studies are not discussed as entities; instead, their findings are reported in terms of their implications upon (a) intellectual growth, (b) academic achievement, or (c) social and personal adjustment.

Studies of Intellectual Growth

Several studies of preschool and primary school-age educable mentally retarded children report significant gains in intelligence during the first school experience, whether it be at age four, five or six, or whether the children are enrolled in special classes or in the regular grades. For example, Kirk (1958) found that 25 children predominantly from lower socio-economic homes, enrolled in a special preschool class at the average age of four and one-half years, gained an average 11.2 IQ points on the Stanford-Binet by age six, while 26 control children remaining at home showed no change in IQ during this period. These controls entered regular classes at age six, and one and one-half years later showed an average gain of 6.9 IQ points on the Stanford-Binet, with similar gains on other tests. The experimental children held their earlier IQ gain, but exhibited no further significant gain by the age of seven and one-half. Preschool and non-preschool groups in an institution for the retarded showed essentially the same patterns of change, except that the institutionalized controls showed an average loss of 7.2 IQ points before school entrance, a loss which was not regained during attendance in the institution's primary classes.

Kirk's study suggests strongly that retarded children who are institutionalized or who come from lower socioeconomic level homes accelerate their rate of mental development through preschool or first grade experience, whereas without such stimulation they tend to retain or, if institutionalized, to reduce their rate of mental growth.

Smith & Stroud (1960) studied the learning characteristics of educable mentally retarded children as represented (a) by motor, social and educational development, (b) by family background, and (c) by pediatric and psychiatric examination. Three special classes of 15 children each were organized. The three classes were limited to children aged 6 through 7, 8 through 9, and 10 through 12, respectively. The Binet IQ's in each class were between 50 and 70. Three existing similar classes located in another community served as a comparison group.

At the end of the first year, the intelligence test data showed that the youngest group had gained an average of 5.6 points in Binet IQ, the middle group had lost 1.5 points, and the oldest group gained 1 point. At the end of the second year, the young children showed no further change. These results tend to confirm Kirk's (1958) findings and emphasize the effect on IQ of the experience gained during the first year of school.

Only one study claims to have effected a sustained, positive, accelerated rate of intellectual development in its school-age retarded subjects. This study by Schmidt (1946) reported dramatic changes as a result of the educational procedures applied in the experimental classes for adolescent children. Kirk (1948), however, investigated the study and found that the data had been reported inaccurately.

Studies of Academic Achievement

Bennett (1932) compared fifty retarded children in special classes with retarded children in the regular grades. All the children were between 12 and 13 years of age. The groups were matched on chronological age, mental age, and IQ with a mean IQ of about 73 for each group. Her results showed that the retardates who remained in the regular classes were superior in academic achievement to those assigned to special classes.

Pertsch (1936) elaborated on Bennett's study by enlarging the sample to 278 children ages 7 through 12 in special and regular classes. Again, the results showed that the retardates remaining in the regular classes were superior in academic achievement to those who had been assigned to special classes.

Blatt (1958) matched 75 educable mentally retarded children in special classes (in a community where all educable mentally retarded children were purportedly in special classes) with similar children in regular grades (in a community that had no special classes). He found no differences in academic achievement.

Cassidy & Stanton (1959), in Ohio, followed Blatt's design but increased each group to 94. In this study, the retarded children in the regular grades were superior in academic achievement to those placed in special classes.

Elenbogen (1957) compared children with two years of enrollment in special classes in the Chicago public schools with retardates in regular classes. Again, the regular class children surpassed those in special classes in academic achievement.

Thurstone (1959) compared 769 educable mentally retarded children in special classes in North Carolina with 504 similar children in regular grades. The first evaluation with the Stanford Achievement Test showed the children in the regular grades to be scoring significantly higher in all subtests except arithmetic. The testing program was repeated one year later and gain scores were calculated. These showed no significant differences between groups in the skills and information gained during the year.

Ainsworth (1959) compared educable mentally retarded children in Georgia in three types of educational settings. Forty-eight children were in special classes, 78 in regular classes, and 48 in regular classes receiving the services of an itinerant teacher who was a specialist in teaching the retarded. The children were pretested with a series of educational achievement tests and were rated on behavior and social adjustment. They were retested one year later. The data showed that all three groups had made progress during the school year, but that there were no significant differences between groups.

Wrightstone, Forlano, Lepkowski, Sontag, & Edelstein (1959) studied special class educable mentally retarded children grouped by IQ in three types of classrooms. The high educable group had IQ's approximating a range of 60 to 75; the low educable group, 50 to 59; and the third group was made up of both high and low educable children. The achievement data showed no appreciable differences between groups.

Mullen & Itkin (1961) compared 140 educable mentally retarded children in special classes with 140 similar children in the regular grades on a matched pair design. The following seven variables formed the basis for matching: age, IQ, sex, socioeconomic status, reading achievement, school attendance in the rural south, and foreign language spoken at home. After one year, the comparison of pre- and posttests showed no group differences in academic achievement gains with the exception that the retardates in the regular class gained more in arithmetic than did the special class children.

Studies of Social and Personal Adjustment

Johnson (1950) studied the social position of educable mentally retarded children in the regular grades. He confined the study to grades one through five in two communities without special classes. Distributed through this grade range he found 39 children with IQ's of 69 and below. His sociometric data showed that the retarded children were generally isolates and/or were rejected by their classmates. Reasons for rejections were most frequently based on behavior traits unacceptable to the non-retarded children.

Johnson & Kirk (1950) repeated the study in a more progressive school system as compared to the traditional school systems in which Johnson did his study. The obtained results were similar. Retarded children in the regular grades were found to be isolated and/or rejected despite the fact that the teachers in the progressive system made an effort to integrate them in the regular classroom.

Baldwin (1958) studied educable mentally retarded children in the regular graoes of a school district that also had special classes. Like

Johnson, she found that those retardates who had remained in the regular grades were generally isolated and/or rejected.

In comparing the personality status of educable mentally retarded children in special classes with that of retardates in regular classes, Blatt (1958) found no significant differences. Cassidy & Stanton (1959), however, found their special class sample to be superior in some aspects of personality and social development. Elenbogen (1957) also found that teachers in special classes rated their children higher in social adjustment than did teachers with retardates in their regular classes. Thurstone (1959) went beyond teacher ratings to include sociometric techniques. Her results paralleled those of Johnson by showing that the retardates in the regular grades were isolates, while those in special classes appeared to be better adjusted emotionally, took part in social activities, and were looked upon more favorably by their peers.

Jordan & deCharms (1959) used a projective device to compare retardates in special classes with those in regular classes on the basis of n-achievement motive. On the basis of a content analysis of a modified Thematic Apperception Test, they reported that retarded children in special classes had less fear of failure than did retardates in the regular grades.

Summary of Previous Research

Special educational provisions for mentally retarded children increased at a modest rate up to the period immediately following World War II. The increase in special class enrollments since that time has been dramatic, and all indications point to a continuation of the beliefs and attitudes that underlie this continuing growth. At the present time, however, there is no clear-cut empirical evidence to support the belief that retarded children placed in special classes show greater development in intellectual, academic, or social adjustment. The research literature points to the following inferences:

1. Retarded children from lower socioeconomic areas show an accelerated rate of mental development when given preschool education or, lacking this, tend to gain in IQ scores during the first year of school experience in regular or special classes.
2. When children are placed in special classes after failure in regular classes, their academic achievement is lower than children of comparable chronological and mental age who were not referred to special classes but remained in the regular grades.
3. In social adjustment and personality, the evidence points to the rejection of retarded children in the regular grades, with sporadic evidence that placement in a special class assists social adjustment and self-concept.

Methodological Critique of Previous Research

Several methodological problems that have been encountered in previous research make the results of the studies questionable. These problems include (a) selection of the children, (b) pre-placement experiences of special class children, (c) the educational program, and (d) evaluation. Each of these four methodological problems is discussed below.

Selection of Children

A major methodological problem in *in situ* research is the selection of the sample. In some of the studies reviewed, educable mentally retarded children already in established special classes were compared with those with similar IQ's in regular classes. While the groups might have been comparable in IQ, mental age, and socioeconomic background, they may not have been the same in other important aspects. It is easily recognized that assignment to a special class is influenced by the "nuisance value" of the retarded child in the regular class. Thus, children with serious learning and/or behavior problems are given preference when assignment decisions are made. It is probable, then, that retarded children already in special classes are inferior to retarded children in regular classes in academic and personality factors--exactly those variables that are measured in comparison of the classes. It is, therefore, hardly surprising that these studies found the educable mentally retarded children in regular classes superior in academic achievement.

It will be recalled that one study (Mullen & Itkin, 1961) attempted to control for this selection factor by matching children on the following seven variables felt to be crucial to this type of study: age, IQ, sex, socioeconomic status, reading achievement, school attendance in the rural South, and foreign language spoken at home. The matching procedure presumes that the researcher has identified the crucial variables and that they are measurable at the present time. The authors state, that in spite of matching, they found selective factors which determined placement and which affected the comparisons made.

Two studies (Blatt, 1958; Cassidy & Stanton, 1959) attempted to control for selection by comparing children in established special classes in one community with educable mentally retarded children in regular classes in a community where no special classes existed. The strategy to avoid biases in selection in these studies was based on the assumption that the characteristics of educable mentally retarded children would be randomly distributed (a) in communities where all educable mentally retarded children in the school system were in special classes, and (b) in communities where no educable mentally retarded children were in special classes.

On the surface, this strategy has considerable merit and is, in fact, superior to that employed by previous researchers. When one pursues the all-versus-none comparison, however, certain crucial questions arise. First, in the community where all educable mentally retarded children were purported to be in special classes, does this mean all or does it mean all who were referred? If the school system did not engage in an exhaustive screening of all of its students and if it did not evaluate individually each prospect for special class placement, it is highly likely that educable mentally retarded children were placed on the basis of some system of referral. Since the latter is more likely the case, it is highly probable that this sample did not include some of the educable mentally retarded children of higher academic ability who were not problems in class.

Second, in the communities where no children were in special classes, certain children were probably included in the sample who, because of their behavior and ability, would probably not be referred for placement. The test of this assumption would be to open special classes in such communities and to observe the referral and selection procedures. Experience would suggest that comparatively few of the higher level retardates in the "no-class" community would be assigned to special classes. Thus, the special class data were probably deflated by the exclusion of high-performing educable mentally retarded children, and the no-class data inflated by the inclusion of children who would not ordinarily be assigned to a special class. The interaction of these conditions probably vitiated any differences found in these studies.

The biases in sample selection arising out of comparing children in existing special classes for the educable mentally retarded with similar children in the regular grades is probably serious enough in itself to question results of the research that has been reported.

Pre-placement Experience of Special Class Children

Another methodological problem arises from selection procedures used by previous researchers. The effects of school experiences prior to special class placement are uncontrolled and unknown. Few educable mentally retarded children are placed in special classes early in their school careers. Most are permitted to fail in regular classes for two, three, or four years before referral is made. A typical special class will have in it children with varied experiences in regular classes. A reasonable evaluation of special classes should not be contaminated by the confounding effects of previous regular class experience which may have serious negative effects on motivation for learning and social adjustment in the classroom.

Educational Program

A third methodological problem typical of the design of previous research involves the question of the nature of the educational program and the teacher's competence. Placing an educable mentally retarded child in a special class is an administrative procedure only. Beyond this, the special program or curriculum and the ability of the teacher to draw the program and the characteristics of the children into a constructive whole assume primary importance. Previous research comparing special and regular class placement has omitted any mention of program and of teacher competence. With neither program nor teacher described, there remains the possibility that the program and the teacher's attributes differed little from what is found in regular classes. Experience suggests that the area of education for the mentally retarded is one in which program development is still in an emergent stage, and in which teacher preparation is still varied in terms of the nature and amount of instruction and practice.

If special classes are to be compared with other types of educational provisions, those factors which give a special class its special nature need to be an integral part of the total assessment picture. This is of particular importance because special classes vary considerably in their constituency, administration, and educational programs. Teachers vary in qualification from very intensively prepared (a minority of special class teachers) to those who have had only short-term summer session instruction under questionable conditions and instructors. Thus, the administrative designation of "special class" does not assure its being representative of special classes for research purposes.

Evaluation

The major focus of evaluation of most studies on special classes is on academic achievement. Within the special class, however, academic subjects fit into a context which also emphasizes social and occupational learning. In this sense, academic subjects are intended to be means toward an end, rather than ends in and of themselves. Thus, evaluation of a special class program needs to take into account such concepts as social adjustment, motivation, and self-concept. In studies where these have been assessed, the instrumentation has been questionable insofar as reliability and validity are concerned. Those standardized personality measures which have been used only evaluate sketchily the variables purported to be an outcome of the special class program. Without a balanced assessment, therefore, a real picture of the efficacy of the special class cannot be obtained.

Summary of Critique

Previous studies of the efficacy of special classes for educable mentally handicapped children reveal the following methodological inadequacies: (a) Sample selection was not controlled adequately; (b) No consideration was given to the effects of the varying regular school experiences of special class children; (c) There were no indications of "specialness" in the special class educational program or in the preparation of the teacher; and (d) Serious discrepancies existed between the goals of the special class and the measures chosen as indicators of effectiveness.

Statement of the Problem

The purpose of this study was to determine the efficacy of special classes for educable mentally retarded children with respect to their intellectual development, academic achievement, and social and personal adjustment. The study was designed to take into account methodological inadequacies which had characterized previous investigations.

The major operational hypothesis was as follows: The placement of educable mentally retarded children in special classes at the beginning of their school careers, with specially trained teachers and an optimal special program, will have a more positive effect on their rate of intellectual development, academic achievement, and social and personal adjustment than will continuation in the regular public school classes.

The sub-hypotheses were as follows:

1. Educable mentally retarded children placed in special classes will develop intellectually at a more rapid rate than will similar children placed in regular classes.

2. Educable mentally retarded children in special classes will achieve academically at a higher level than will similar children placed in regular classes.

3. Educable mentally retarded children placed in special classes will show a more adequate social and personal adjustment than will similar children placed in regular classes.

In addition to the hypotheses tested, an attempt was made to determine social characteristics of children who improve intellectually through attendance in special classes.

PROCEDURES

In this chapter various aspects of the procedures are discussed. These include the sample selection and placement procedures, characteristics of the sample, and description of the educational program and its evaluation.

The experimental design of the present study consisted of (a) screening all children (1,938) at the beginning of their first-grade experience in school districts where primary level special classes did not exist, (b) identifying the 129 children who scored below or at 85 IQ[1] on the Stanford-Binet Scale (1937 Form L), and (c) randomly determining placement for these 129 children into two groups, part of which were placed in special classes while the rest remained in their original first grade classes. All of these children were examined periodically for four years in order to evaluate the effects of regular and special class treatment on intellectual, academic, and personality factors.

Sample Selection and Placement Procedures

The selection and placement of children were accomplished through the following procedures.

1. The Primary Mental Abilities Test (PMA), Primary Battery, was administered during the first five weeks after the opening of school in September to every entering first-grade child (1,938) in the

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[1] While most school codes still specify IQ limits of 50 to 75 for special classes for the educable mentally retarded, the practice is to admit children with IQ's as high as the low 80's. Upper limits of IQ 85 were therefore established to accommodate all children who might be assigned to a special class.

20 cooperating school districts. The cooperating school districts were those within an 80-mile radius of Urbana, Illinois. These school districts did not already have primary level classes for the educable mentally retarded and the boards of education agreed to cooperate for the four-year period. All children who scored at or below 85 IQ on the PMA were scheduled for examination with the Stanford-Binet Scale (1937, Form L).

2. The 290 children who scored at or below 85 IQ on the PMA were tested individually with the Stanford-Binet Scale (1937, Form L). Only 129 of the original 1,938 were found to score at or below 85 IQ on both the PMA and the Stanford-Binet tests (6.7 percent).

3. Four special classes were established in the three Illinois counties involved in the study. One class each was established in the two counties which were predominantly rural. Two classes were established in the one urban center of the third county.

4. Three of the original 129 children identified as appropriate for the study were lost prior to class assignment and the remaining 126 children were randomly assigned to one of the two conditions to be studied. Children to be placed in the special classes (experimental group) were transferred into newly established classes while the remaining children (control group) were left in their original regular first grades. The only restrictions placed on the random assignment of children to the special classes were that (a) a maximum of 15 children could be placed in a single special class, (b) placement had to be restricted to the child's

originating county, and (c) permission for placement had to be obtained from the parents.[2]

Of the 126 remaining children, 57 were placed in special classes while the remaining 69 became control subjects.[3] The experimental children were divided 15 to a class with the exception that one rural class had only 12 children. Although there was a surplus of control children, they were all located in the other counties and could not be used to increase the enrollment in the rural county class.

Characteristics of the Sample

The data on intellectual development were obtained from the initial testing with the selection instruments. These data are presented in this chapter for the sample as it was originally constituted and again for that portion of the sample which actually remained four years in the study. Effects of IQ changes on the composition of the sample are also discussed.

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[2] After the two groups had been formed, it was found that four families refused to have their children in the special classes. Three of the four based their decisions on the amount of travel time required. The fourth objected to placement in the special class. It was decided that these cases would be permitted to remain in the study as controls and alternates were selected at random from the control group to replace them.

[3] Although 129 children had been identified initially as mentally handicapped, three left the community prior to the study. Thirteen of the 126 children were found to be repeating the first grade. Five of these children were placed in special classes and the remaining eight were assigned to the control group. These children were generally one year older than the others in the study.

Psychometric Characteristics

The psychometric characteristics of children selected initially for the study and those remaining for the four years of the experiment are presented in Table 1. Of the 126 children selected for the study, the children in the control group were slightly higher in IQ on the Stanford-Binet (1937, Form L) and Primary Mental Abilities Test but slightly lower on the Peabody Picture Vocabulary Test. However, differences in IQ between the 126 children selected and the 93 children who remained in the study were slight. All means were well within the range expected by chance. Although the attrition rate for the study was 26.2 percent, there did not appear to be a consistent selective factor related to degree of intelligence.[4]

Effects of IQ Changes on Sample Characteristics

Early in the study some of the children increased in their intelligence test scores at a rate which exceeded original diagnoses. By the end of the four years of the study the Stanford-Binet Deviation IQ's for the total group ranged from 61 to 114, inclusively. The distributions of IQ's for the four years for the experimental and control groups are shown in Table 2. It is immediately apparent that a large number of these children could not be classified as "mentally retarded" according to the final year evaluation.

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[4] Most of the attrition took place at the end of the first year of the study. On one county, three experimental-group children whose IQ scores increased to over 90 at the end of the first year were transferred to regular classes and are not included in the data analysis.

Table 1

Means and Standard Deviations of IQ's and CA's for All 126 Children Selected for Experimental and Control Groups and for 93 Children Remaining in Study for Four Years

	126 Children Selected		93 Children Remaining	
Test	Mean IQ	SD	Mean IQ	SD
Experimental Group				
Stanford-Binet	76.71	6.38	76.24	7.06
Peabody Picture Vocabulary	81.73	14.14	80.33	13.04
Primary Mental Abilities[a]	68.68	9.86	67.27	10.21
Chronological Age (in months)	77.29	4.42	76.37	4.48
N	57		41	
Control Group				
Stanford-Binet	78.48	5.94	79.34	5.67
Peabody Picture Vocabulary	80.08	14.84	80.80	14.06
Primary Mental Abilities[a]	71.60	9.94	72.29	9.89
Chronological Age (in months)	79.08	5.40	77.79	5.41
N	69		52	

[a] Two children in the control group who remained in the study scored below the norms of the Primary Mental Abilities test and were not included in these computations.

Table 2

Distribution of Deviation IQ's (Stanford-Binet, 1937, Form L) for Experimental and Control Children

Scores	Pretest		1st Year		2nd Year		3rd Year		4th Year	
	Exp	Cont	Exp	Cont	Exp	Cont	Exp	Cont	Exp	Cont
111-115					1					1
106-110					0	2			1	1
101-105				1	1	1	1	3	2	3
96-100			2	3	0	2	2	3	2	1
91-95			4	5	1	5	4	7	5	6
86-90			4	10	9	11	2	8	2	14
81-85	9	18	8	15	6	13	5	7	5	5
76-80	12	16	13	11	10	8	8	5	11	8
71-75	11	13	7	3	10	4	11	11	5	6
66-70	2	3	3	2	2	3	4	4	4	4
61-65	5	0	0	0	0	1	2	1	2	3
56-60	2	2	0	2	0	0	0	1	1	0
51-55	0	0	0	0	0	0	1	0	0	0
N	41	52	41	52	40*	50*	40*	50*	40*	52

*Variable N's indicate some subjects not tested.

To make the results of this study more meaningful with reference to mentally retarded children, as usually defined, data for variables other than intelligence were analyzed separately for those children still scoring within the traditional IQ limits (50-80) for the educable mentally retarded, and for those children scoring above those limits. To serve this purpose, the groups were subdivided on the basis of the average of the final two Stanford-Binet ratio IQ scores. The term "average terminal IQ" will be used henceforth to denote the scores obtained in this fashion. Children whose average terminal IQ's were 80 or below were considered to be mentally retarded in the usual sense. The data for these children were analyzed separately from those children whose average terminal IQ's were above 80. The final two test scores were averaged to provide a more stable indication of classification. The percentage of children with IQ scores over 80 for each year of the study is shown in Table 3. After the first year, about 35 to 45 percent of the experimental group children and 55 to 70 percent of the control group children scored over 80 IQ.

Table 3

Percent of Experimental and Control Children With Deviation IQ's of 81 or Above at Each Year of the Study

Groups	Pretest	1st Year	2nd Year	3rd Year	4th Year
Experimental					
Total N	41	41	40	40	40
N above 80	9	18	18	14	17
Percent above 80	22.0	43.9	45.0	35.0	42.5
Control					
Total N	52	52	50	50	52
N above 80	18	34	34	28	31
Percent above 80	34.6	65.4	68.0	56.0	59.6

Educational Program and Evaluation[5]

The educational program of the four experimental classes was based upon A Curriculum Guide for Teachers of the Educable Mentally Handicapped (Goldstein & Seigle, 1958) developed at the University of Illinois in collaboration with the Illinois State Department of Education. The curriculum guide is organized on the basis of life problem areas. These areas include (a) citizenship, (b) communication, (c) home and family, (d) leisure time, (e) management of money and materials, (f) occupational adequacy, (g) physical and mental health, (h) safety, (i) social adjustment, and (j) travel. There was an extended reading readiness program based on the areas delineated in the Thurstone Primary Mental Abilities Test for ages 5 to 7 (Thurstone & Thurstone, 1953). The curriculum of the primary program consisted of social studies (including science and health), language development, reading, spelling, arithmetic, and the non-academic areas of music, arts and crafts, and physical education.

In the course of the four years of the study, a total of 10 teachers, seven females and three males, each with certification in mental retardation, taught the special classes. No one teacher taught the same class for more than two years. Marriage, pregnancy, and family mobility were responsible for the turnover in teachers.

To insure a comparability in educational program in the four classes, teacher conferences were held and close supervision was maintained. The teachers were convened, usually at six-week intervals, to exchange experiences and plans. Each summer, the teachers devoted four to eight weeks to evaluting the previous year's accomplishments and preparing materials for the coming year. The supervisor maintained close contact with the teachers and assisted them in the development of teaching materials. She acted as liaison between the teachers and other members of the project staff.

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[5] The description of the educational program is included in Appendix A.

The children were evaluated annually through a battery of psychological tests and academic achievement measures. The tests were administered by the research staff and psychometrically trained advanced graduate students. These tests are listed in the chapters of this report which describe the findings of the study. During the first two years of the project interviews with parents were conducted under the direction of a sociologist.[6] Graduate students in social work were employed as interviewers.

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[6] Findings on family relationships of the children in the study as compared with children of normal intelligence appear in Appendix B.

RESULTS I: INTELLIGENCE

The data presented in this section have been analyzed primarily to test the hypothesis that educable mentally retarded children placed in special classes will develop intellectually at a more rapid rate than will similar children placed in regular classes.

The above hypothesis assumes that intellectual behavior grows and develops as a function of environment very much like every other aspect of human development. The specific hypothesis tested in this project was that the particular circumstances associated with special class programming would be more beneficial to the development of intellectual behavior in retarded children than would experiences found by retarded children in regular classes.

In addition to the hypothesis testing, the data were also analyzed to determine whether factors unrelated to the special or regular classes influenced the intellectual development of the children in the course of the study.

Test of Hypothesis

The results of several intelligence tests are reported in this chapter. Although the Stanford-Binet (1937, Form L) was the only test administered each year throughout the study, the children were also tested at different times with the Primary Mental Abilities (PMA) test, the Peabody Picture Vocabulary Test (PPVT), and the Wechsler Intelligence Scale for Children (WISC). The points in time at which these tests were administered are presented in Table 4.

Table 4

Measures Used for the Study of Intellectual Development at Each Stage of the Study

Name of Test[a]	Pretest	1st yr.	2nd yr.	3rd yr.	4th yr.
S-B	Sept.	May	May	May	May
PMA	Sept.	May	--	--	--
PPVT	Sept.	May	May	--	May
WISC	--	--	--	Jan.	Jan.

[a] S-B: Stanford-Binet, Form L (1937)

PMA: SRA Primary Mental Abilities Test, Primary Battery.

PPVT: Peabody Picture Vocabulary Test, Form A

WISC: Wechsler Intelligence Scale for Children

Stanford-Binet Scale

The Stanford-Binet Scale (1937, Form L) was administered at the beginning of the study and every spring thereafter for four years. The obtained ratio IQ's were converted to deviation IQ's (Pinneau, 1960). The mental age and deviation IQ means, standard deviations, and total increases for each group over the four years of the study are presented in Table 5. The data in Table 5 and Table 6 indicate that:

1. The control children had slightly higher IQ's at the beginning of the study, a mean of 76.92 as compared with 74.20 for the experimental children. The controls maintained their superiority during the four years of the study. This difference over the four years was statistically significant as shown by the analysis of variance in Table 6.

2. The experimental children increased an average of seven points while the control children increased six points between the pretest and the first-year test. By the end of the fourth year the experimental children maintained the seven-point increase, while the control children had increased to eight IQ points. Thus, both groups made a significant increase in IQ over the four-year period.

3. It will be noted from Table 5 that the major increase in IQ was made by the end of the first year, stabilizing somewhat for the next three years.

The same general findings were obtained with reference to mental age. The control children had on the average a three and one-half month advantage at the beginning of the study. Both groups gained approximately 11 months between the pretest and the first-year test. Both groups gained approximately 40 months in mental age during the four years of the study.

These results indicate that the IQ's of the children in this study increased significantly as a result of school experience, whether or not the children were in special classes or regular grades. There is no evidence to indicate that the treatment had a differential effect on the Stanford-Binet performance of the two groups. Thus, the hypothesis that children assigned to special classes would develop intellectually at a more rapid rate than similar children in regular classes, was not upheld.

Wechsler Intelligence Scale for Children

The Wechsler Intelligence Scale for Children (WISC) was administered for the first time in January of the third year of the study and again in January of the fourth year. The means, standard deviation, and total increase for the Verbal Scale, Performance Scale, and Full Scale IQ's for both administrations are presented in Table 7.

Table 5

Stanford-Binet (1937, Form L) Deviation IQ and MA Means, Standard Deviations, and Net Increases for Experimental and Control Children

	Year of Testing					
Group	Pre-test	First Year	2nd Year	3rd Year	4th Year	Net Gain
Experimental IQ						
Mean	74.20	81.24	81.18	78.28	81.25	7.05
S.D.	7.32	7.87	8.95	10.13	11.67	
N	41	41	40	40	40	
Control IQ						
Mean	76.92	82.96	84.32	82.12	85.37	8.45
S.D.	5.93	8.55	9.38	10.99	11.30	
N	52	52	50	50	52	
Experimental MA						
Mean	59.07	70.46	79.75	87.12	98.55	39.48
S.D.	5.93	5.79	8.40	10.23	14.63	
N	41	41	40	40	40	
Control MA						
Mean	63.02	73.08	84.16	92.86	103.15	40.13
S.D.	5.83	6.91	9.26	11.71	14.47	
N	52	52	50	50	52	

Table 6

Summary of Analysis of Variance of Stanford-Binet IQ's; Pretest and Subsequent Year Tests

Source of Variance	df	SS	s^2	F	$F_{.05}$
Between Subjects	86	25,385.325	295.180		
Between Groups	1	1,465.720	1,465.720	5.21*	3.96
Error (b)	85	23,919.600	281.410		
Within Subjects	348	13,148.000	37.780		
Between Years	4	2,888.000	722.000	23.59*	2.41
Interaction	4	40.720	10.180	0.34	2.41
Error (w)	340	10,219.280	30.060		
Total	434	38,533.325			

*Significant beyond .05 level.

Table 7

Wechsler Intelligence Scale for Children (WISC) Verbal, Performance, and Full Scale IQ Means, Standard Deviations, and Total Increases for Experimental and Control Children

	Experimental		Control		Gain	
Scale	3rd Year	4th Year	3rd Year	4th Year	Exper.	Contr.
Verbal Scale						
Mean	80.32	83.02	80.68	83.14	2.70*	2.46*
S.D.	9.27	9.49	9.41	11.10		
N	40	40	50	51		
Performance Scale						
Mean	83.50	88.05	85.48	87.55	4.55*	2.07*
S.D.	11.37	11.57	9.69	10.75		
N	40	40	50	51		
Full Scale						
Mean	80.05	83.95	81.30	83.74	3.90	2.44
S.D.	9.50	10.03	8.61	10.10		
N	40	40	50	51		

*Significant beyond .05 Level.

It may be noted in Table 7 that:

1. The performance scores were higher than the verbal scores for both groups.

2. Both groups made significant increases in IQ scores between the first and second tests on both parts of the WISC.

3. There was very little difference between the experimental and control children in the amount of gain made as shown in Tables 8 and 9.

The statistical analysis of these data (Tables 8 and 9) shows a significant increase in IQ scores on both the Verbal and Performance Scales, but there were no differences between the two groups. Again, the Wechsler, like the Binet, indicates that although some increases in IQ were made by both groups, there was no significant difference between those children attending special classes and those assigned to regular grades.

Peabody Picture Vocabulary Test

The Peabody Picture Vocabulary Test (PPVT) was administered four times during the study. It was administered with the pretest selection battery and again each time that the Stanford-Binet Scale was given, except for the third year. The means, standard deviations, and total net increases in IQ obtained with this test are presented in Table 10. These data indicate:

1. The mean PPVT IQ's of both the experimental and control groups were essentially the same at the beginning of the study (80.32 and 80.80, respectively).

2. Both groups made increases between the pretest and the first-year test with minimal change following the first year.

Table 8

Summary of Analysis of Variance of WISC Verbal IQs for Experimental and Control Children for Both Test Administrations

Source of Variance	df	SS	s^2	F	$F_{.05}$
Between Subjects	87	13,943.45			
Between Groups	1	3.54	3.54	0.02	3.96
Error (b)	86	13,939.51	162.08		
Within Subjects	88	2,340.50			
Between Years	1	229.55	229.55	9.37*	3.96
Interaction	1	3.36	3.36	0.13	3.96
Error (w)	86	2,107.59	24.50		
Total	175	16,283.95			

*Significant beyond .05 level.

Table 9

Summary of Analysis of Variance of WISC Performance IQ's
for Experimental and Control Children for Both Test
Administrations

Source of Variance	df	SS	S^2	F	$F_{.05}$
Between Subjects	87	17,479.41			
Between Groups	1	38.59	38.59	0.18	3.96
Error (b)	86	17,518.00			
Within Subjects	88	3,385.50			
Between Years	1	563.78	563.78	17.48*	3.96
Interaction	1	47.45	47.45	1.47	3.96
Error (w)	86	2,774.27	32.25		
Total	175	20,903.50			

*Significant beyond .05 level.

Table 10

Peabody Picture Vocabulary Test (PPVT) IQ Means, Standard Deviations, and Net Increases for Control and Experimental Children

Groups	Year of Testing					
	Pre-test	1st Year	2nd Year	3rd Year	4th Year	Net Gain
Experimental						
Mean	80.32	83.68	85.78	-----	84.12	3.80*
S.D.	13.04	10.68	7.39		10.48	
N	40	41	41		40	
Control						
Mean	80.80	87.69	87.62	-----	86.14	5.34*
S.D.	14.06	9.95	10.03		12.38	
N	51	52	50		50	

*Significant beyond .05 level.

3. Minimal differences in IQ are noted between the two groups in the net gain (3.80 for experimental group as compared with 5.34 for the control group) over the four years of the study.

The analysis of variance (Table 11) of these data shows a significant increase in IQ scores for both groups with no difference between the groups and no interaction between groups and years. Again, there is no evidence to indicate that the educational treatment had a differential effect on the two groups in the development of intelligence.

Primary Mental Abilities Test

The Primary Mental Abilities Test, Primary Battery, was administered as a part of the pretest selection battery and again as a criterion measure at the end of the first year of the study. The data obtained by use of this instrument for the two administrations are presented in Table 12, with the analysis of variance summarized in Table 13. The data were derived from the PMA tables and based upon the average CA's and average PMA, MA's for both groups. It may be noted from Table 12 that:

1. At pretest, the control children scored approximately four months higher in mental age than the experimental children (MA's 55.88 and 51.60, respectively).

2. Both groups made marked increases in mental age between the pretest and first-year test (controls, 17.64 months; experimentals, 17.60 months in an eight-month period), with very little difference between the groups in net gain.

Table 11

Summary of Analysis of Variance of PPVT IQ Scores for Experimental and Control Children

Source of Variance	df	SS	s^2	F	$F_{.05}$
Between Subjects	85	28,644.74			
Between Groups	1	402.85	402.85	1.19	3.96
Error (b)	84	28,241.89	336.21		
Within Subjects	258	16,752.00			
Between Years	3	1,977.32	659.10	11.34*	3.88
Interaction	3	135.62	45.20	0.77	3.88
Error (w)	252	14,639.06	58.09		
Total	343	45,396.74			

*Significant beyond .05 level.

Table 12

Primary Mental Abilities Mental Age Means, Standard Deviations, Net Increases for Experimental and Control Children

Groups		MA Scores Pre-test	1st Year	Net Gain
Experimental				
	Mean	51.60	69.20	17.60*
	S.D.	8.91	6.30	
	N	41	41	
Control				
	Mean	55.88	73.72	17.64*
	S.D.	9.39	8.13	
	N	52	50	

*Significant beyond .05 level.

The data from the PMA mental age analysis in Table 13 provide no evidence (no significant interaction) to indicate that the educational treatment had a differential effect on the experimental and control groups. The hypothesis relating to the development of intelligence is therefore not upheld with reference to these data.

Summary of Data Relating to Hypothesis

The data on changes of intelligence test scores consistently support the following two conclusions:

1. Significant increases in test scores were observed during the first year of the study for both experimental and control children whether in special classes or regular grades, and maintained these gains for the duration of the study.

2. There were no significant differences in the amount of gain made between children attending special classes and those attending regular grades.

These data, therefore, provide no evidence in support of the hypothesis that educable mentally retarded children placed in special classes will develop intellectually at a more rapid rate than will similar children placed in regular classes. The observation that intelligence test scores increase when children enter an educational program is consistent with the findings of Kirk (1958) and Smith & Stroud (1960), discussed earlier in the review of literature.

Nonexperimental Factors in Changes in Intelligence

Because of the failure of the data to support the hypothesis tested, several analyses were performed to determine whether any factors not

Table 13

Summary of Analysis of Variance of PMA Mental Age Scores for Experimental and Control Children

Source of Variance	df	SS	s^2	F	$F_{.05}$
Between Subjects	90	10,773.979			
Between Groups	1	790.069	790.069	7.042*	3.96
Error (b)	89	9,983.910	112.178		
Within Subjects	91	16,790.000			
Between Years	1	14,313.165	14,313.165	514.490*	3.96
Interaction	1	0.848	0.848		
Error (w)	89	2,475.987	27.820		
Total	181	27,563.979			

NOTE.--For the purpose of this analysis, scores for two subjects from the control group who were not examined at the end of the first-year test were discarded.

*Significant beyond the .05 level.

associated with special-class or regular-class placement were associated with changes in intelligence. Analyses included (a) level of intelligence, (b) promotion or repetition of first grade by control group children, and (c) social factors.

Level of Intelligence

In addition to the comparison of experimental and control groups as a whole on intelligence test scores, a further breakdown of IQ scores was made. In this analysis the Stanford-Binet terminal IQ scores were used to divide the groups into a High-IQ Group and a Low-IQ Group. For the High-IQ Group a terminal IQ of 81 and above was used. For the Low-IQ Group the terminal IQ of 80 or less was used. The data for these groups are presented in Table 14. It will be noted from Table 14 that:

1. The High-IQ Group showed initial IQ's of 76.32 for the experimental (E) group, and 78.86 for the control (C) group. In contrast, the Low-IQ Group showed an initial IQ of 71.74 and 72.94 for the E and C children.

2. For the High-IQ Group the gains during the first year for both the E's and the C's were approximately 7 IQ points. For the Low-IQ Group the first year gains were approximately 6 IQ points for the E group and 3 IQ points for the C group.

3. The High-IQ Group gained consistently throughout the four years, showing a total gain of 13 and 11 points, respectively, for the E and C groups. In contrast, the Low-IQ Groups tended to show declines after the first and second years terminating in the fourth year at approximately the same IQ as the initial score.

4. It should also be noted that the standard deviations of the High-IQ Group increased, whereas the standard deviations of the Low-IQ's tended to decrease.

Table 14

Stanford-Binet Deviation IQ Means and Standard Deviations for Experimental and Control Children Subdivided According to Terminal IQs

Group	Pretest	1st Year	2nd Year	3rd Year	4th Year
HIGH-IQ GROUP[a]					
Experimental					
Mean	76.32	83.86	85.86	84.48	89.09
S.D.	6.65	7.64	8.98	8.72	9.09
N	22	22	22	21	22
Control					
Mean	78.86	86.31	87.77	87.71	89.60
S.D.	3.77	6.32	8.16	8.23	8.26
N	35	35	35	34	35
LOW-IQ GROUP[b]					
Experimental					
Mean	71.74	78.21	75.44	71.42	71.67
S.D.	7.45	7.18	4.59	6.59	5.79
N	19	19	18	19	18
Control					
Mean	72.94	76.06	76.27	70.25	71.47
S.D.	7.54	8.54	6.85	4.93	5.21
N	17	17	15	16	17

[a] High-IQ Group: Children with terminal IQs of 81 or above.

[b] Low-IQ Group: Children with terminal IQs of 80 or below.

This post hoc analysis of data does not relate to the original hypothesis, but is actually a search for possible factors which may account for changes in IQ between children, whether in special classes or regular grades. Actually, in practice, IQ's of children which partially determine their eligibility for assignment to special classes are obtained after the child has failed in the regular grades for two or more years.

The high-IQ children in this study, regardless of placement, exhibited IQ's by the end of the first year of the study that would ordinarily disqualify them for special class placement. The low-IQ children, however, remained eligible for special class placement at any given period in the study.

The data in Table 14 are not sufficient to make definite conclusions but do suggest that children who are generally classified as borderline retarded (IQ's 75 to 85) when tested at age six, may not be retarded at ages 7, 8, or 9. There is a greater likelihood that children who are lower (IQ's 60 to 74), similar to the Low-IQ Group in this section, may be viewed as more representative of the mentally retarded population.

It is for these reasons that analysis of the achievement in the next section is presented for high- and low-IQ groups as well as for total experimental and control groups.

Mental Age Development and Promotion

Half of the control children who finished the study with average terminal IQ's above 80 had been retained a year in the first grade while the other half had been promoted through the grades without retention. It was noted that both the retained children and the promoted children of this particular group had identical mental ages (63.4 months) at the beginning of the study. This interesting coincidence of equal numbers and equal mental ages provided an opportunity to explore some of the relationships between intellectual development and grade placement.

Table 15 presents a summary of the increases in mental age scores for both the retained and promoted groups in relation to grade placement. The promoted group made a gain of 13.2 months in mental age during the first year while the retained group made a gain of 10.7 months during the same period. During the time that the retained group was repeating the first grade it made a gain of only 8.5 months. Both groups made essentially the same amount of gain while attending second grade (13.5 and 14.3 months) and third grade (10.1 and 10.4 months).

Thus, three points stand out in Table 15:

1. The promoted group appeared to be getting off to a better start as evidenced by the greater gain in mental age during grade one.

2. The retained children made the least gain on mental age during the time they were repeating first grade.

3. Both groups achieved essentially the same mental age growth while in the second and third grades, although the promoted group was a year younger at these grade levels than the retained group.

Because of the small number of cases these data do not lend themselves to definitive conclusions, but at least raises the question as to the effects of retention in the first grades on increases in intelligence test scores.

Table 15

Mean Mental Age Increment for Retained and Promoted Control Children (IQ's above 80) by Grade Levels

Group	N	MA Increment by Grade Level				
		1st Grade	1st Repeated	2nd Grade	3rd Grade	4th Grade
Retained	16	10.7	8.5	13.5	10.1	--
Promoted	16	13.2	--	14.3	10.4	13.3

Social Factors in IQ Changes

Several social factors were examined to determine whether they influenced change in IQ of the experimental and control children. There is evidence that community, ethnic, social class, and friendship characteristics may influence the intellectual development of children. Appendix B reports an investigation in which the children who participated in the study were compared with normal children of comparable socioeconomic status living in the same neighborhoods. The findings indicated that families with educable mentally retarded children (a) showed a lower level of integration into the community, (b) provided less adequate resources in the home, (c) were characterized by family relationships reflecting instability, inattentiveness, and overcrowding, and (d) were less capable of motivating children intellectually and academically.

In this section, children in the study who increased by at least 10 IQ points from the pretest to the final year were compared with children who showed a smaller increase or a decline in IQ. Comparisons were made on the basis of county of residence, race, income, education of mother, and friendship and neighborly interaction. Information on marital status, mother's education, and interaction with friends and neighbors was gathered in interviews with the mother. Both parents were required for the marital integration scale.

The findings appear in Table 16. Except for results on community of residence, there were no appreciable differences between the children in the experimental and control group. The following trends appear in the data:

1. The greatest increases, by county of residence, occur for the experimental children in Kankakee County and the control-group children in Vermilion County. In both of these groups, about half of the children rose over 10 points in IQ during the course of the study. Although this increase was possibly due to chance, the data suggest that the community factors rather than the special class were responsible for the rise in IQ.

2. Relatively fewer Negroes than Caucasian children increased significantly in IQ.

3. More mothers who had over eight years of schooling had children whose IQ rose at least 10 points than did mothers with eight or fewer years of education.

4. With regard to community interaction, mothers who indicated a higher degree of interaction with neighbors and with friends tended to fall into the group whose children increased significantly in IQ.

Table 16

Social Factors in Increase in Intelligence Test Scores During Study

Factor	Percentage of Children with Significant Rise in IQ[a]	Percentage of Children whose IQ did not Rise Significantly	N
County of Residence			
Kankakee experimental	47.6	52.4	21
Kankakee control	31.0	68.9	29
Vermilion experimental	30.0	70.0	10
Vermilion control	53.3	46.7	15
Ford experimental	22.2	77.8	9
Ford control	25.0	75.0	8
Race			
Negro	28.6	71.4	21
Caucasian	39.4	60.6	71
Education of Mother			
Over eight years of schooling	45.2	54.8	42
Eight or fewer years of schooling	31.1	68.9	45
Mother's Visiting with Neighbors			
Visiting with at least one neighbor	44.2	55.8	52
No visiting	31.4	68.6	35
Mother's Seeing Friends			
Regularly or often	53.8	46.2	26
Sometimes or never	31.7	68.3	60
Marital Integration			
High (0 - 10 discrepancy scores)	48.3	51.7	29
Low (12 - 38 discrepancy scores)	27.3	72.7	33
Marital Status of Mother			
In first marriage	39.7	60.3	58
Other than first marriage	33.3	66.7	33

[a] At least 10 points.

5. Parents who had a relatively high degree of marital integration,[1] as indicated by their consensus on family values, tended to have children whose IQ's increased significantly.

6. There was a slight tendency for mothers who were in their first marriage to fall into the group whose children had risen in IQ significantly.

The data on social factors in the rise in IQ can be summarized by describing the typical mother according to the trends in the data. The typical mother whose child tended to rise in IQ significantly during the investigation was (a) Caucasion, (b) had more than eight years of education, (c) interacted to a higher degree with neighbors and with friends, (d) tended to have a higher marital integration, and (e) was more often in her first marriage. Although family income had been included in the analysis, it was not found to be related to the tendency for the child to increase in IQ significantly.

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[1] This measure, which is a modification of a marital integration scale developed by Farber (1957), required each parent to rank independently the importance of five family values. The values were (a) a place in the community, (b) economic security, (c) emotional security, (d) moral and religious unity, and (e) the home. Discrepancy scores between husband and wife were computed (the sum of the square of the squared differences in rank).

RESULTS II: ACADEMIC ACHIEVEMENT

In this section the results on academic achievement are reported with reference to the hypothesis that educable mentally retarded children placed in special classes will achieve academically at a higher level than will similar children placed in regular classes. Academic achievement was determined by standardized tests of school achievement.

The above hypothesis forms one of the foundations upon which the concept of special classes for educable mentally retarded children is based. It has generally been assumed that the educable mentally retarded child would not acquire academic skills consistent with his ability under regular class conditions, but that he would more likely do so within the structure of the special class. The achievement hypothesis was tested by use of the instruments listed in Table 17.

Some of the measures in Table 17 are diagnostic instruments rather than indicators of achievement. The diagnostic measures were included to suggest specific difficulties of educable mentally handicapped children in the use of language. Results of the diagnostic tests given in the fourth year only are presented in this chapter; however, because of their complexity, findings on the Illinois Test of Psycholinguistic Abilities are presented in Appendix C.

The results on academic achievement are discussed in this chapter under the headings of reading achievement, arithmetic achievement, and basic social information. Because many of the children in both experimental and control groups attained an IQ above 80 after the beginning

Table 17

Measures Used for the Study of Academic Achievements

Year of Project	Name of Test
First	Lee-Clark Reading Test, Primer[a]
	Harrison-Stroud Reading Readiness Profiles,[b] selected parts
	New York Test of Arithmetical Meanings,[c] selected parts
	Stanford Achievement Test[d]
Second	Metropolitan Achievement Test, Primary II Battery[e]
	Test of Basic Information,[f] Experimental edition, 1961
Third	Metropolitan Achievement Test, Elementary Battery[g]
	Test of Basic Information,[f] Experimental edition, 1962
	Illinois Test of Psycholinguistic Abilities[h]
Fourth	Metropolitan Achievement Test, Elementary Battery[g]
	Illinois Test of Psycholinguistic Abilities[h]
	Gray Oral Reading Paragraphs Test[i]
	Iota Word Recognition Test[j] from the Monroe Diagnostic Reading Examination
	Word-Discrimination Test[j] from the Monroe Diagnostic Reading Examination
	Sound-Blending Test[j] from the Monroe Diagnostic Reading Examination
	Tachistoscope Word Recognition Test[k] from the Durrell Analysis of Reading Difficulty

[a] Lee, J. M., & Clark, W. W. Lee-Clark Reading Test, Primer, Form A. Los Angeles: California Test Bureau, 1958.

[b] Harrison, M. Lucile, & Stroud, J. B. The Harrison-Stroud Reading Readiness Profiles. Boston: Houghton Mifflin, 1956.

[c] Wrightstone, J. W., Justman, J., Pincus, M., & Lowe, Ruth H. New York Test of Arithmetic Meanings, Level 1. New York: World Book, 1956.

[d] Kelley, T. L., Madden, R., Gardner, E. F., Terman, L. M., & Ruch, G. M. Stanford Achievement Test, Primary Battery, Form J., Part 5, Arithmetic Computation. New York: Harcourt, Brace & World, 1952.

[e] Durost, W. N., Bixler, H. H., Hildreth, Gertrude H., Lund, K. W., & Wrightstone, J. W. Metropolitan Achievement Test, Form A, Primary II Battery. New York: Harcourt, Brace & World, 1960.

[f] Moss, J. W. Test of Basic Information, Experimental edition. Urbana: Institute for Research on Exceptional Children, University of Illinois, 1961 & 1962.

[g] Durost, W. N., Bixler, H. H., Hildreth, Gertrude H., Lund, K. W., & Wrightstone, J. W. Metropolitan Achievement Test, Form A, Elementary Battery. New York: Harcourt, Brace, & World, 1960.

[h] McCarthy, J. J., & Kirk, S A. Illinois Test of Psycholinguistic Abilities, Experimental edition. Urbana: University of Illinois Press, 1961.

[i] Gray, W. S. Gray Oral Reading Paragraphs Test. Bloomington, Illinois: Public School Publishing Co., 1915.

[j] Monroe, Marion. Children Who Cannot Read. Chicago: University of Chicago Press, 1932.

[k] Durrell, D. D. Durrell Analysis of Reading Difficulty. New York: Harcourt, Brace & World, 1955.

of the study, the data have been analyzed separately for children of high and low IQ. In the presentation of findings, the high-IQ group refers to children with an average terminal IQ of 81 or above, while the low-IQ group refers to those with an average terminal IQ of 80 or below.

An analysis of achievement test scores over the four years of the study is methodologically questionable because of the variety of instruments used. However, the conversion of raw scores into "grade equivalances" introduces some degree of comparability. Even so, differences in scores, tests, and norms make this approach somewhat tenuous. These limitations should be kept in mind in the discussion of the development of some of the academic skills over the four years of the study in order to help gauge the effect of the special class program. Although scores are expressed in terms of grade equivalences, all statistical analyses were based on raw scores.

Reading Achievement

In the experimental class program, special attention was given in the first year to reading readiness. The findings on reading achievement provide a basis, in part, for evaluating this program. The findings are discussed first in terms of general reading and language achievement, and then in terms of specific reading skills.

General Reading Skills

Achievement in general reading skills was measured in the first year by the Lee-Clark test and in the other years by the Metropolitan Achievement Test. The trends in the development of general reading skills are shown in tabular form in Table 18, and graphically in Figures 1 and 2.

Table 18

Development of Reading Skills Over Four-Year Period for Experimental and Control Subjects by Total and IQ Groups

	Year			
Groups	**1st**	**2nd**	**3rd**	**4th**
Total Groups				
Experimental: Grade Equivalent	1.2	1.6	2.6	3.1
Mean Raw Score	8.49	16.07	11.68	15.54
Standard Deviation Raw Score	5.01	5.82	4.68	5.84
N	41	41	40	41
Control: Grade Equivalent	1.7	1.9	2.6	3.2
Mean Raw Score	18.31	25.68	11.88	17.12
Standard Deviation Raw Score	9.87	11.13	6.03	6.61
N	51	50	50	49
t	5.81*	5.00*	0.17	1.19
High-IQ Groups				
Experimental: Grade Equivalent	1.2	1.6	2.6	3.3
Mean Raw Score	7.50	14.73	12.29	17.77
Standard Deviation Raw Grade	2.46	6.13	4.85	5.95
N	22	22	21	22
Control: Grade Equivalent	1.8	2.0	2.7	3.3
Mean Raw Score	20.94	27.89	12.91	18.37
Standard Deviation Raw Score	8.40	10.78	6.05	6.67
N	35	35	34	35
t	8.88*	5.87*	0.40	0.34
Low-IQ Groups				
Experimental: Grade Equivalent	1.3	1.7	2.5	2.7
Mean Raw Score	9.63	17.63	11.00	12.95
Standard Deviation Raw Score	6.79	5.14	4.52	4.62
N	19	19	19	19
Control: Equivalent Grade	1.5	1.8	2.4	2.8
Mean Raw Score	12.56	20.53	9.69	14.00
Standard Deviation Raw Score	10.65	10.52	5.53	5.52
N	16	15	16	14
t	0.99	1.05	-0.77	0.59

NOTE--1st Year Test - Lee-Clark
2nd Year Test - MAT Primary II
3rd Year Test - MAT Elementary
4th Year Test - MAT Elementary

*$p < .05$

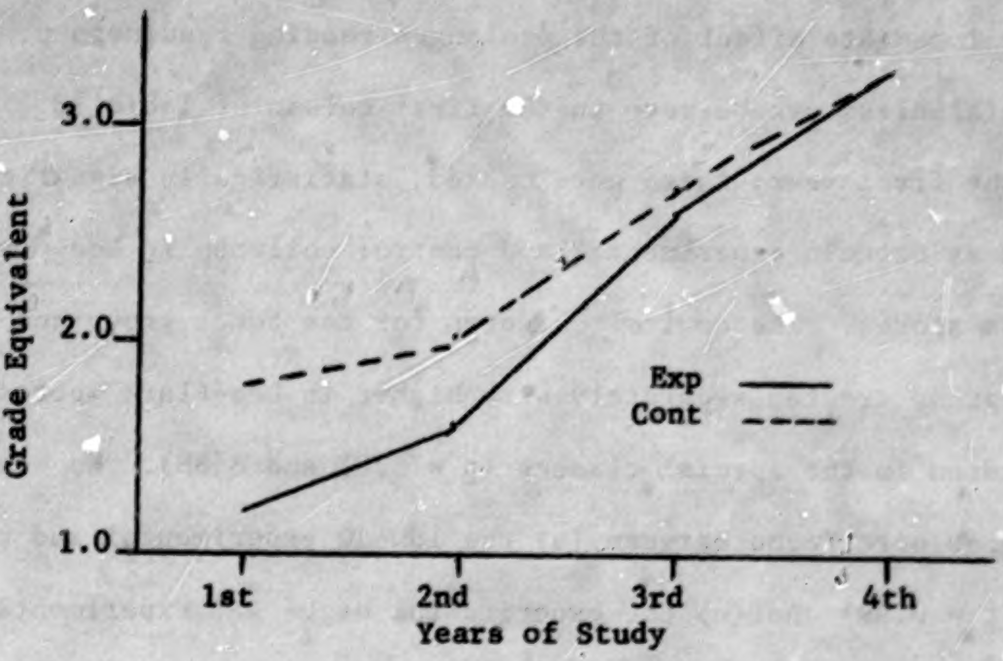

Figure 1
Development of Reading Skills Over Four-Year
Period for Experimental and Control
High-IQ Groups

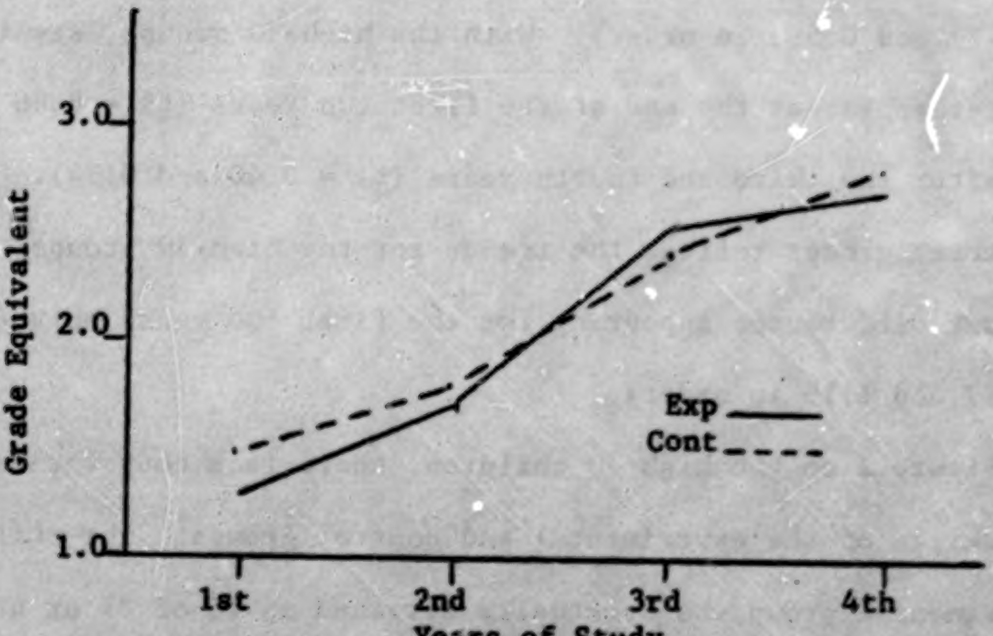

Figure 2
Development of Reading Skills Over Four-Year
Period for Experimental and Control
Low-IQ Groups

The immediate effect of the prolonged reading readiness program in the special class can be seen in the first column of Table 18. At the end of the first year, there were marked, statistically significant differences between experimental and control children in Lee-Clark readiness scores. The control children for the total group and for the high-IQ group treated separately were higher in Lee-Clark scores than the children in the special classes (_t_ = 5.81 and 8.88). No significant differences were found between (a) the low-IQ experimental and control groups (_t_ = 0.99) and (b) the experimental high- and experimental low-IQ groups (_t_ = 0.90). The high-IQ control group was significantly superior in the first year to the low-IQ control group (_t_ = 3.25).

When all columns in Table 18 are analyzed, few other differences which are statistically significant emerge. In the analysis of reading development of the low-IQ children, there are no significant differences between experimental and control children at any year level (_ts_ = 0.99, 1.05, -0.77 and 0.59, in order). With the high-IQ groups, significant differences appear at the end of the first two years (_ts_ = 8.88 and 5.87) but not after the third and fourth years (_ts_ = 0.40 and 0.34). The scores for the total groups reflect the trends for the high-IQ groups, with significant differences appearing for the first two years only (_ts_ = 5.81, 5.00, 0.17 and 1.19 in order).

In Figure 1 on the high-IQ children, there is a convergence of the reading skills of the experimental and control groups. The children in the experimental group who eventually attained an IQ of 81 or above were inferior to their counterparts in the control group at the end of the first year. By the fourth year, the differences between experimental and control children had disappeared. Trends for the low-IQ children are shown in Figure 2. Rather than a convergence or divergence in development of the experimental and control low-IQ children, the general reading skill appears to fluctuate around a trend line for both groups. A comparison of the equivalent grade scores in the fourth year for the high- and low-IQ groups suggests that either nonexperimental factors (such as those discussed in Results I on IQ changes during the study) rather than special class placement is responsible for general reading achievement or contradictory results in specific subtests are concealing special class effects on reading achievement.

The findings on the development of general reading skills neither support the hypothesis that educable mentally retarded children in special classes will achieve in reading at a higher level than will similar children in the regular classes, nor do they indicate that mentally retarded children in the regular grades achieve at a higher level as reported in previous studies.

Specific Skills in Reading and Language Use

The achievement of specific skills required for reading and language use was evaluated through four subtests of the Metropolitan Achievement Test and a series of diagnostic measures. The analyses of the measures of specific skills are described below in terms of language achievement, spelling achievement, word usage and reading comprehension, and diagnostic reading tests.

Language Achievement. Most instruments which purport to measure language in children are concerned with the product of language development. Such tests are generally tests of achievement designed to determine the extent to which children have mastered the grammatical forms required by middle-class standards of written communication. This was the case with the language subtest of the Metropolitan Achievement Test (MAT) used in this study. The results on the MAT language subtest are presented in Table 19. On this subtest, the low-IQ subgroup of experimental children were found to score significantly better than the children in the low-IQ control group (_t_ = 2.57). No differences were found between the experimental and control high-IQ groups of the total groups.[1]

Spelling Achievement. The results of the spelling subtest of the Metropolitan Achievement Test are presented in Table 20. This table reveals a large variance in raw scores as compared with the size of the mean. For the low-IQ control group, the standard deviation is actually a larger number than the mean. In spite of the large differences observed between the group means, none was statistically significant. Because of the size of the variance, an additional analysis was performed on children with especially low spelling scores. This analysis is shown in Table 21. There were 13 control children who made spelling scores of three or less while there were only six experimental children who made such low scores.

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[1] The relationship between language as measured by the Metropolitan Achievement Test and Stanford-Binet mental age is indicated by the correlation of +.366 for the experimental group and +.406 for the control group.

Table 19

Language Subtest of the Metropolitan Achievement Test (Fourth Year) Raw Score Means and Standard Deviations and Grade Equivalent Means for Experimental and Control Children for Total and IQ Groups

Groups		Raw Score Mean	Raw Score S.D.	Grade Equiv. of Mean
Total Groups				
Experimental	(N=41)	23.76	9.06	2.8
Control	(N=49)	24.08	11.66	2.8
t		0.14		
High-IQ Groups				
Experimental	(N=22)	26.59	9.39	3.2
Control	(N=35)	28.49	9.59	3.3
t		0.73		
Low-IQ Groups				
Experimental	(N=19)	20.47	7.65	2.2
Control	(N=14)	13.07	8.88	1.4
t		2.57*		

*$p < .05$

Table 20

Spelling Subtest of the Metropolitan Achievement Test (Fourth Year) Raw Score Means and Standard Deviations and Grade Equivalent Means for Experimental and Control Subjects by Total and IQ Groups

Groups		Raw Score Mean	Raw Score S.D.	Grade Equiv. of Mean
Total Groups				
Experimental	(N=41)	15.12	11.22	3.5
Control	(N=49)	17.80	12.75	3.8
t		1.05		
High-IQ Groups				
Experimental	(N=22)	17.73	11.85	3.8
Control	(N=35)	21.17	11.80	4.0
t		1.07		
Low-IQ Groups				
Experimental	(N=19)	12.11	9.89	3.1
Control	(N=14)	9.36	11.36	2.9
t		-0.74		

Table 21

Chi-Square Analysis[a] of Raw Scores of Metropolitan Spelling Subtest for Experimental and Control Subjects by Total and IQ Groups

Total Groups

	Spelling Raw Score		
	Three or Less	Greater Than Three	
Exp.	6	35	X^2=0.94
Cont.	13	39	

High-IQ Groups

	Spelling Raw Score		
	Three or Less	Greater Than Three	
Exp.	2	20	X^2=0.13
Cont.	3	32	

Low-IQ Groups

	Spelling Raw Score		
	Three or Less	Greater Than Three	
Exp.	4	15	X^2=3.91*
Cont.	10	7	

$*p < .05$

[a] Yates correction for continuity employed throughout.

Differences in psycholinguistic abilities between the high- and low-IQ groups emerged on the Illinois Test of Psycholinguistic Abilities results, reported in Appendix C. There was greater variation in the subtest profile for the high-IQ children than for the low-IQ children. This difference in variation suggests that the incidence of learning disabilities is higher among the high-IQ children than among the low-IQ children. In addition, the disproportionate number of children in the control group who scored that low on the spelling subtest was sufficient to produce a significant Chi-Square of 3.91 (df = 1) for the low-IQ groups in favor of the experimental children. No significant differences were observed for the high-IQ group and for the total group.[2]

Word Recognition and Reading Comprehension. The data from the subtests of the Metropolitan Achievement Test (Word Knowledge, Word Discrimination, and Reading Comprehension) given in the fourth year are presented in Table 22. There was a statistically significant difference only for the Word Discrimination test. This difference is noted only for the total experimental and control groups ($t = 2.39$).

Diagnostic Reading Tests. A battery of diagnostic reading tests was administered to all subjects in the fourth year. These tests included (a) Gray's Oral Reading Paragraphs, (b) the Iota Word Test, the Word Discrimination Test, and the Sound Blending Test from the Monroe Battery, and (c) the Tachistoscope word recognition test from the Durrell Analysis of Reading Difficulty battery. The data from these tests are presented in Table 23 for the total groups and for the groups by IQ levels. Although

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[2] The correlations between spelling scores and Stanford-Binet mental ages for the experimental and control children were +0.492 and +0.460, respectively.

Table 22

Three Reading Subtests of the Metropolitan Achievement Test (Fourth Year) Raw Score Means and Standard Deviations and Grade Equivalent Means for Experimental and Control Children for Total and Reclassified Groups

Groups	Word Knowledge	Word Discrimination	Reading Comp.
Total Groups			
Experimental: Grade Equivalent	3.1	3.1	3.1
Mean Raw Score	17.95	15.07	15.54
Standard Deviation Raw Score	9.04	8.44	5.84
N	40	41	41
Control: Grade Equivalent	3.4	3.5	3.2
Mean Raw Score	21.00	19.35	17.12
Standard Deviation Raw Score	9.14	8.50	6.62
N	50	49	49
t	1.58	2.39*	1.34
High-IQ Groups			
Experimental: Grade Equivalent	3.2	3.5	3.3
Mean Raw Score	20.05	17.91	17.77
Standard Deviation Raw Score	10.45	9.02	5.95
N	22	22	22
Control: Grade Equivalent	3.5	3.9	3.3
Mean Raw Score	23.20	21.69	18.37
Standard Deviation Raw Score	9.12	7.64	6.67
N	35	35	35
t	1.20	1.70	0.34
Low-IQ Groups			
Experimental: Grade Equivalent	2.8	2.8	2.7
Mean Raw Score	15.39	11.79	12.95
Standard Deviation Raw Score	6.31	6.49	4.62
N	18	19	19
Control: Grade Equivalent	2.9	3.0	2.8
Mean Raw Score	15.87	13.50	14.00
Standard Deviation Raw Score	7.08	7.91	5.52
N	15	14	14
t	0.21	0.68	9.59

*$p < .05$

Table 23

Means and Standard Deviations for Raw Scores on Components of a Diagnostic Reading Battery for Experimental and Control Subjects by Combined and IQ Groups

Groups	Diagnostic Reading Battery Subtests[a]				
	1	2	3	4	5
Total Groups					
Experimental (N=40)					
Mean	9.02	28.38	26.62	12.62	6.12
S.D.	7.20	12.87	8.73	12.43	3.80
Control (N=50)					
Mean	10.26	31.64	26.92	16.50	5.04
S.D.	8.23	15.02	10.56	13.83	3.42
_t_	-0.75	-1.09	-0.14	-1.38	1.42
High-IQ Groups					
Experimental (N=22)					
Mean	10.27	31.18	27.50	15.36	6.55
S.D.	8.04	14.05	9.10	14.13	4.22
Control (N=34)					
Mean	12.62	37.76	31.76	21.26	6.32
S.D.	7.64	10.75	6.90	13.06	3.30
_t_	-1.10	-1.98	-1.99	-1.60	0.23
Low-IQ Groups					
Experimental (N=18)					
Mean	7.50	24.94	23.33	9.28	5.61
S.D.	5.86	10.65	7.92	9.29	3.26
Control (N=16)					
Mean	5.25	18.62	16.62	6.38	2.31
S.D.	7.33	14.75	9.65	9.42	1.62
_t_	0.99	1.44	2.23*	0.90	3.67*

*$p < .05$

[a] Diagnostic Reading Battery Subtest Titles:
1 Gray's Oral Reading Paragraphs
2 Iota Word Recognition
3 Word Discrimination
4 Tachistoscope
5 Sound Blending

several of the differences between means were large, significant differences were observed only for word discrimination and sound blending in favor of the low-IQ experimental children ($t = 2.23$ and 3.67). It is worth noting, however, that there is some consistency in the direction of the scores. The low-IQ experimental children were superior to the low-IQ control children on all diagnostic tests, while, except for sound blending, the reverse was true for the high-IQ groups.[3]

Ten specific language tests were administered to experimental and control groups. The results of this comparison need to take into account differences in IQ's and MA's of total experimental and control groups in spite of randomization. Specifically, the average MA of the control group at the end of the study was 103.15 months and for the experimental group, 98.55 months (see Table 5). This difference of four and one-half months in MA would be expected to be reflected in higher reading scores on the part of the controls. This was precisely what was found. This difference in MA would therefore account for the slight trends in reading scores favoring the controls. Statistical tests of significance applied to the ten tests showed only one [(MAT) word discrimination] to be significant. It is therefore concluded that there was no difference between total experimental and control groups in reading and language achievement.

When the groups were divided as described earlier, high- and low-IQ groups, slightly different results were obtained. For the high-IQ group there were no statistically significant differences between groups although trends were in favor of the controls in all tests except sound blending. These trends cannot be accounted for by differences in MA and IQ as in the case of the total group (see Table 14). This table shows that the IQ's of E and C are essentially the same.

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[3] Correlations between diagnostic test scores and mental ages are found in Table D-1 in Appendix D.

In examining the data for the low-IQ groups, it was found that four of the ten tests favored statistically the experimental group. The trends, however, varied. Table 14 shows that the average IQ's of the Low-IQ E and C Groups were identical and differences cannot be accounted for on this basis.

From the analysis of the data on the three groups, it can be stated that the results of the 10 tests give only partial support (based on the Low-IQ Groups) for the hypothesis that special class children will demonstrate higher academic achievement than will retarded children in the regular grades.

Arithmetic Achievement

Achievement in quantitative skills was determined by the Arithmetic Computation and Problem Solving subtests of the Metropolitan Achievement Test battery.

Table 24 presents the data pertaining to the development of arithmetic skills for the four-year period. The data is analyzed for (a) the total group, (b) the High-IQ Group, and (c) the Low-IQ Group. Among the high-IQ children, a significant difference ($\underline{t} = 6.47$) in favor of the control group is noted at the end of the first year only. A similar

Table 24

Development of Arithmetic Skills Over Four-Year Period for Experimental and Control Subjects by Total and IQ Groups

Groups	Year			
	1st[a]	2nd[b]	3rd[c]	4th[c]
Total Groups				
Experimental: Grade Equivalent	1.2	1.8	2.9	3.6
Mean Raw Score	1.32	44.15	12.00	20.32
Standard Deviation Raw Score	2.21	9.65	6.03	7.37
N	41	41	40	41
Control: Grade Equivalent	1.5	1.6	2.7	3.6
Mean Raw Score	5.69	40.00	11.22	19.98
Standard Deviation Raw Score	5.41	14.64	8.49	13.15
N	51	49	50	52
t	4.85*	1.61	0.49	0.16
High-IQ Groups				
Experimental: Grade Equivalent	1.2	1.8	3.0	3.8
Mean Raw Score	0.73	45.95	13.38	22.73
Standard Deviation Raw Score	0.94	7.89	6.31	6.22
N	22	22	21	22
Control: Grade Equivalent	1.7	1.8	3.2	4.0
Mean Raw Score	7.62	46.24	14.41	25.51
Standard Deviation Raw Score	5.37	10.97	7.96	11.48
N	34	34	34	35
t	6.47*	0.10	0.50	1.61
Low-IQ Groups				
Experimental: Grade Equivalent	1.3	1.7	2.6	3.5
Mean Raw Score	2.00	42.05	10.47	17.53
Standard Deviation Raw Score	2.98	11.21	5.45	7.76
N	19	19	19	19
Control: Grade Equivalent	1.3	1.2	1.9	2.5
Mean Raw Score	1.82	25.87	4.44	8.59
Standard Deviation Raw Score	2.86	11.96	4.90	8.12
N	17	15	16	17
t	0.18	4.06*	3.42*	3.38*

*p $<$.05

[a] New York Test of Arithmetical Meanings, selected parts

[b] Metropolitan Achievement Test, Primary II, Arithmetic Computation and Problem Solving

[c] Metropolitan Achievement Test, Elementary Battery, Arithmetic Computation

significant difference (t = 4.85) was found at the end of the first year with the total group. No significant differences were found during subsequent years either for the high-IQ groups or for the total groups. For the low-IQ children, except for the first year, experimental children were significantly higher in arithmetic computation scores than the control children (t = 0.18, 4.06, 3.42, and 3.38, in order).

Trends in the development of arithmetic computation skills are shown in Figures 3 and 4, derived from the data in Table 24. For the high-IQ children, after the first year there appeared to be little difference between the experimental and control groups. For the low-IQ children, however, there is an increasing divergence in achievement between the experimental and control groups, with a markedly greater achievement evidenced by the experimental group.

Table 25 presents the results of the Arithmetic Problem Solving and Concepts administered in the fourth year. No significant differences were noted between either the high-IQ subgroups or between the experimental and control children when taken as total groups. The results, however, indicate significant differences in favor of the low-IQ experimental children when compared with the low-IQ control children (t = 3.52).

In summary, the results for the low-IQ children on the subtests of the Metropolitan Achievement Test pertaining to arithmetic computation and problem solving support the achievement hypothesis. However, findings on the high-IQ children generally indicated a trend toward higher achievement in arithmetic by the control group.[4]

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[4] Correlations between mental ages and scores on the arithmetic subtests of the MAT are presented in Table D-2 of Appendix D.

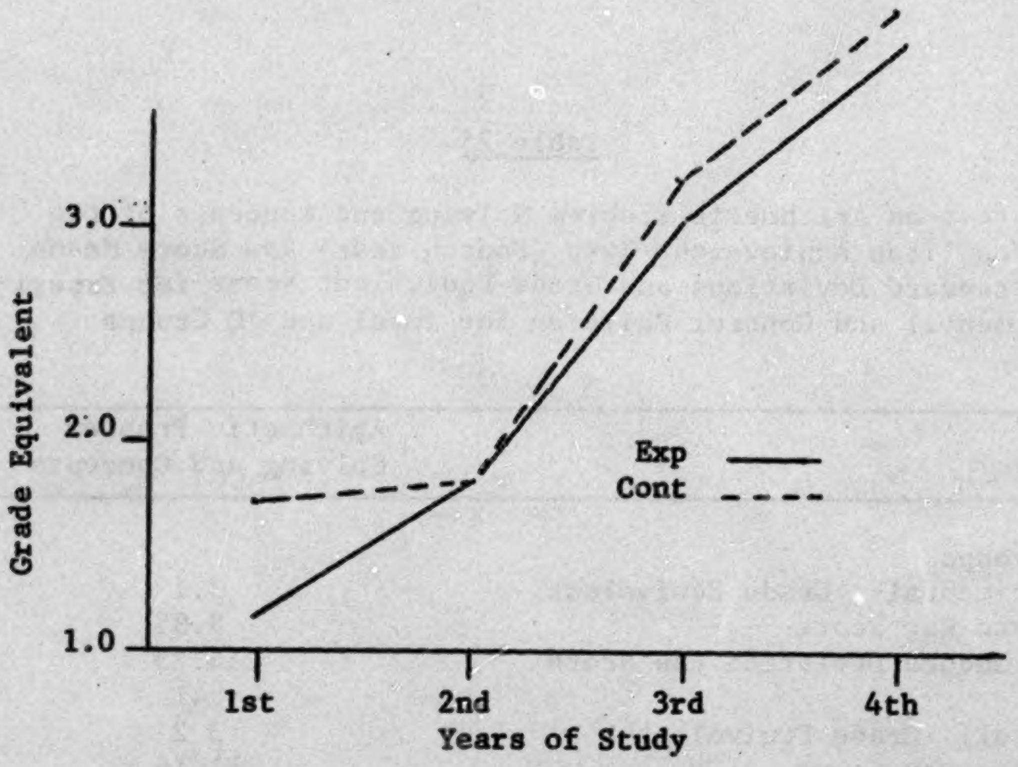

Figure 3
Development of Arithmetic Computation Skills
Over Four-Year Period for Experimental and Control
High-IQ Groups

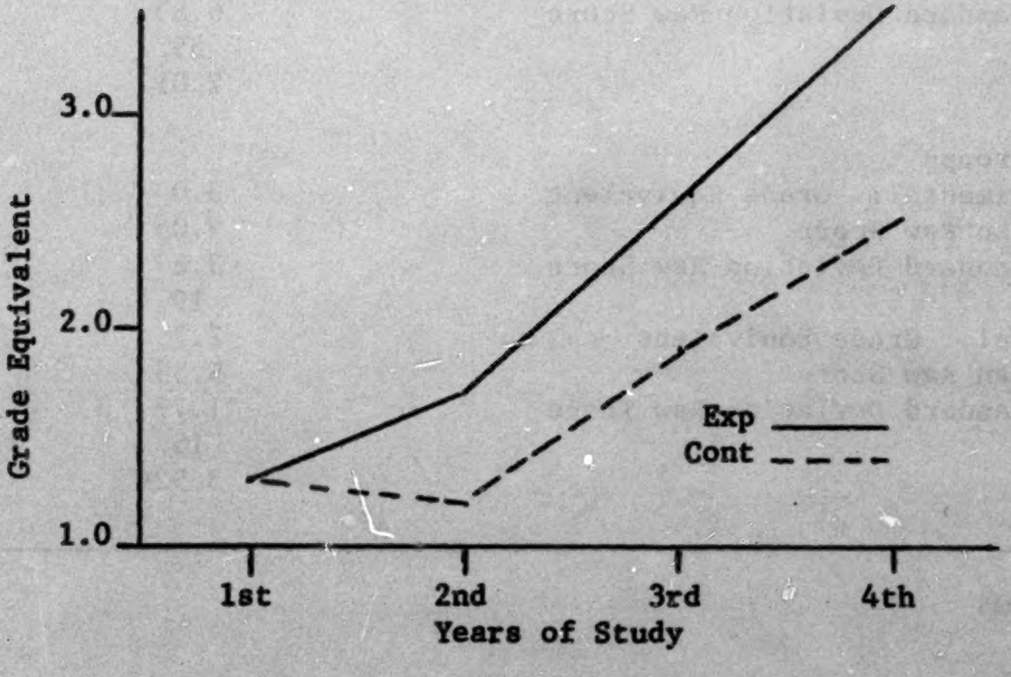

Figure 4
Development of Arithmetic Computation Skills
Over Four-Year Period for Experimental and Control
Low-IQ Groups

Table 25

Subtest on Arithmetic Problem Solving and Concepts of the Metropolitan Achievement Test (Fourth Year) Raw Score Means and Standard Deviations and Grade Equivalent Means for Experimental and Control Children for Total and IQ Groups

Groups	Arithmetic Problem Solving and Concepts
Total Groups	
Experimental: Grade Equivalent	3.1
Mean Raw Score	9.85
Standard Deviation Raw Score	4.23
N	41
Control: Grade Equivalent	3.2
Mean Raw Score	11.16
Standard Deviation Raw Score	6.86
N	50
t	1.12
High-IQ Groups	
Experimental: Grade Equivalent	3.2
Mean Raw Score	10.55
Standard Deviation Raw Score	4.50
N	22
Control: Grade Equivalent	3.6
Mean Raw Score	13.57
Standard Deviation Raw Score	6.83
N	35
t	2.01
Low-IQ Groups	
Experimental: Grade Equivalent	3.0
Mean Raw Score	9.05
Standard Deviation Raw Score	3.87
N	19
Control: Grade Equivalent	2.7
Mean Raw Score	5.53
Standard Deviation Raw Score	1.77
N	15
t	3.52*

*$p < .05$

Basic Social Information

The Test of Basic Information (TOBI) was developed specifically for use in this study. It is designed to test social knowledge of children of primary-grade ages. The manual of instructions and copy of the test are contained in Appendix E.[5] The TOBI consists of two parts. Part I contains items designed to assess the child's knowledge about objects and events assumed by teachers to be common in the community. Part II attempts to assess the child's familiarity with everyday signs and symbols. The test was administered twice during the course of the study: once in the second year, and again in the third year. Although the TOBI was administered twice, the rate of growth cannot be determined because the test was revised between administrations. This revision substantially reduced the number of items in the test. Thus, the absolute scores for the second administration are less than they were for the first administration. The results for both administrations of this test are shown in Table 26.

It can be seen in Table 26 that there was little difference between the groups on the initial administration. The second administration of the test shows a significant superiority of the experimental group at the low-IQ level (t = 2.69). The results for the low-IQ children thus support the hypothesis that children in special classes will achieve academically at a higher level than similar children in regular classes.

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[5] Correlations of Basic Information scores with MAT scores and mental ages appear in Table D-3 in Appendix D.

Table 26

Test of Basic Information (TOBI) Means and Standard Deviations for Experimental and Control Subjects by Combined and IQ Groups

	Second Year		Third Year	
Groups	N	Total Score	N	Total Score
Total Groups				
Experimental	41		40	
Mean		38.22		27.70
S.D.		5.85		4.84
Control	50		45	
Mean		40.30		26.27
S.D.		8.31		5.63
_t_		1.40		1.24
High-IQ Groups				
Experimental	22		21	
Mean		40.36		29.24
S.D.		6.62		4.71
Control	35		32	
Mean		42.69		28.25
S.D.		8.15		4.55
_t_		1.12		0.76
Low-IQ Groups				
Experimental	19		19	
Mean		35.74		26.00
S.D.		3.57		4.51
Control	15		13	
Mean		34.73		21.38
S.D.		5.71		5.14
_t_		0.60		2.69*

*p < .05

A further analysis of Part I of the TOBI revealed differences between Negro children in experimental and control groups in the first administration of the test, and the findings are shown in Table 27. Negro children in regular classes scored significantly lower than (a) Negro children in special classes, and (b) Caucasian children in both experimental and control groups. By the end of the first year, the experimental Negro children had apparently increased in social knowledge to the extent that their scores slightly exceeded that of the Caucasian children in the experimental and control groups. This small superiority by Negro children in the experimental but not in the control group was sustained in the second test of basic information.

Summary of Results on Academic Achievement

The hypothesis tested in this section was that educable mentally retarded children placed in special classes will achieve academically at a higher level than will similar children placed in regular classes. Academic achievement was tested for three areas: reading and language, arithmetic, and basic information.

The results of the study would indicate in general that (a) for total experimental and control groups there were no major differences between the level of achievement of the subjects assigned to special classes and those retained in the regular grades, (b) there was a trend, but not statistically significant, toward higher achievement of the control group for those with higher IQ's (above 80), and (c) there were significant differences in reading and language, arithmetic, and social information for children with lower IQ's (80 and below) in favor of the special class group.

Two interpretations relating to the major hypothesis can be made from this data. One point of view would be that since there were no significant

Table 27

Means and Standard Deviations for Two Administrations of Part I of Test of Basic Information for Experimental and Control Groups by Race

Groups	First Administration			Second Administration		
	N	Mean	S.D.	N	Mean	S.D.
Experimental						
Negro	11	31.82	4.85	10	21.20	2.10
Caucasian	30	28.33	4.41	30	19.03	4.07
Control						
Negro	10	24.40*	4.43	6	17.50	1.38
Caucasian	40	30.52	5.88	39	18.54	4.31

*Significant below all other groups at $p < .05$, t ratios of 2.09, 3.34, and 3.45

differences between the total groups, the hypothesis that special classes are beneficial should be rejected and no further analysis should be made. Another point of view would be that since children with terminal IQ's of 80 and below benefited more academically from special classes than similar children in the regular grades, the special classes are beneficial and the achievement hypothesis for mentally retarded children is upheld.

There are cogent and practical reasons for maintaining the latter rival hypothesis. In school systems children are generally referred for examinations for eligibility for special classes after they have failed in school for one or more years. Their IQ's at this age (seven, eight, or nine) are comparable to the terminal IQ's of the low-IQ group in this study. If their IQ's had increased significantly as a result of school experience as shown in this and other studies, they would have tested above the traditional IQ limit of 80 for assignment to special classes. If they test 80 or below there is a likelihood that they will be assigned to the special class. Therefore it is this low-IQ group that is actually classified as mentally retarded and assigned to special classes. And it is this group for which, in this study, the special class has shown superiority as an educational setting as compared with the regular class.

RESULTS III: SOCIAL AND PERSONAL ADJUSTMENT

This section is concerned with data relating to the hypothesis that educable mentally retarded children placed in special classes will show a more adequate social and personal adjustment than will similar children placed in regular classes.

Three aspects of adjustment are reported: (a) parents' views of their children, (b) the child's relationships with neighborhood peers, and (c) success approaching and failure avoiding in school.

Parents' Views of Their Children

In developing a self-concept, children ordinarily regard their parents' opinion of them as highly important. If the parent derogates the child, it is likely that the child will tend to view himself similarly. Therefore, it was decided to determine how the parent regarded his child as compared with other children, especially in regard to school work.

During interviews conducted in the second year of the project, mothers were asked to compare their children with others on (a) how her child was at school learning, (b) how quickly her child caught on, (c) how her child was at numbers, and (d) how her child did at reading by himself. The results are presented in Table 28.

In response to the question on school learning, 30 percent of the mothers of the control group children regarded their children as being "poorer" than other children, whereas only 10 percent of the mothers of experimental group children viewed their children in this manner. In response to the question concerning how quickly their children caught on, only three

Table 28

Mother's Comparison of Her Child with Other Children

Response	Percentage of Experimental Group Mothers	Percentage of Control Group Mothers
Compared to other children, how is your child at school learning?		
Much better	12.8	6.7
Better	25.6	22.2
Same	51.3	40.0
Poorer	10.3	31.1
Compared to other children, how quickly does your child catch on?		
Much faster	12.8	2.2
Faster	20.5	24.4
Same	43.6	44.4
Slower	23.1	28.9
Compared to other children, how is your child at numbers?		
Much better	15.4	6.7
Better	25.6	4.4
Same	48.7	68.9
Poorer or much poorer	10.3	20.0
Compared to other children, how does your child do at reading by himself?		
Much better	15.4	4.4
Better	25.6	31.1
Same	30.8	44.4
Poorer or much poorer	28.2	20.0
Number of cases	39	45

percent of the control group parents as against almost 13 percent of the experimental group parents replied "much faster." In response to the question of ability at numbers, 20 percent of the control group parents as compared with about 10 percent of the experimental group parents reported "poorer" or "much poorer." Concerning the question on reading, the experimental group mothers were more widely dispersed in their responses than the control group mothers. Fifteen percent of the experimental group parents as compared with four percent of the control group parents thought their child was "much better" than other children at reading by himself. But at the same time 28 percent of the same experimental group parents as compared with 20 percent of the same control group parents considered their child as "poorer" or "much poorer."

In general, the experimental group mothers rated their children as more able and more adequate in school learning, quickness in perception ("catching on"), and reading and arithmetic performances than control group mothers.

The Child's Relationships with Neighborhood Peers

Previous research reviewed in the introduction has suggested that the educable mentally retarded child in the regular classroom is rejected and isolated by his peers; whereas, sociometric analyses indicate that the retarded child in the special class is less rejected and isolated by his special class peers. But can one then draw the implication that an improvement has taken place in the relationship of this child to his normal peers in the school situation? It is suggested that a more vital question is: What happens to these retarded children after school? Can one assume that the observed negative social reaction to the retarded child in the regular classroom carries over so as to bias after-school interaction between the retarded child and his peers? Is the retarded child in the special class better received after school because his normal peers have not been building up an antagonism toward him during the school day? Using the interaction sector approach, which is discussed in Appendix F, children were interviewed one month after the beginning of the second school year of the project. Because of the natural isolation of children in rural areas, it was decided that only those subjects residing in an urban industrial area would be used for this segment of the investigation.

Of the 90 retarded and normal subjects (described in Appendix F) residing in the Kankakee area, 33 were located who met the criteria for inclusion as subjects in this subinvestigation. These included 10 children in the experimental group, 12 in the control group, and 11 normal children of comparable age and socioeconomic characteristics.

Because of the small number of children interviewed, the findings on community relationships of experimental and control group children must be regarded as highly tentative. However, they are suggestive of influences of special class attendance on the child's relationships with his neighborhood peers. The details regarding the interview questions and method of analysis are presented in Appendix F. The results indicate the following:

1. The children in the experimental group were more able to recall names of children in the neighborhood spontaneously than were the control group children.

2. Children in the experimental and control groups were about equally known to the other children in the neighborhood; both were better known than normal peers.

3. The normal children in the neighborhood appear to play somewhat less frequently with the children in the experimental group than with those in the control group.

4. There is little overt rejection expressed by the normal children in the neighborhood of either experimental or control group children.

The principal peer-group effect of the special class seems to be to reduce the probability of interaction between the educable mentally retarded child, and the other children in the neighborhood. The finding of the lack of overt rejection by children in the neighborhood also occurred in the study of high school retardates by Fuchigami (1964).

Success Approaching and Failure Avoiding

The position adopted for the present research was formulated by Rotter (1954) and elaborated by Cromwell (1963). A basic postulate of the theory as applied in this study is that "the occurrence of a behavior of a person is determined not only by the nature or importance of goals or reinforcements, but also by the person's anticipation or expectancy that these goals will occur. (Rotter, 1954, p. 102)." Of particular relevance is the proposition that, in their behavior performance, children will take into account whether that behavior has been generally reinforced positively or negatively in the past. If it has been positively reinforced they will expect continued positive reinforcement and will try to perform that behavior in a situation ordinarily considered appropriate. If they have received negative reinforcement, the children will try to avoid doing it. Moss (1958) has applied the concepts of "success approachers" and "failure avoiders" to this phenomenon. If a child has received positive reinforcement in the past for a given behavior, such as answering questions in class or trying to read aloud, he will develop an expectancy that such behavior would continue to lead to positive reinforcement. He will be a "success approacher." If, on the other hand, a child has received predominantly negative reinforcement for this behavior he will eliminate it from his repertoire of preferred behaviors. If the child finds that he can avoid the negative aspects of the situation in some way, his avoidance of failure is reinforced. Such a child will look for ways of avoiding the potential failure in any similar situation. Such a child can be described as a "failure avoider."

Cromwell (1963) describes a variety of studies which lend some support to this formulation of behavior. Generally speaking, retarded children are "failure avoiders" because of their limited experience with success in academic situations. Normal children are more frequently seen as "success approachers" because of the balance of success and failure they receive in school.

Although there are many ways in which children may behave as a function of continued failure experiences, three specific areas were identified as important to the educational and personal futures of the children: cognitive style, freedom of interaction, and anxiety. Cognitive style refers to the way in which an individual organizes his cognitive processes in his approach to a problem in terms of originality, fluency of thought, and flexibility. Freedom of interaction refers to the extent to which an individual is able to risk being wrong in a situation in which he is uncertain as to the appropriate response. Presumably, a child experiencing failure continually would display little originality, fluency, and flexibility in thinking, a low degree of freedom of interaction, and a high degree of anxiety.

There were no adequate tests available for the assessment of personal adjustment of the mentally retarded with respect to cognitive style, freedom of interaction, and anxiety. The evaluation of personal adjustment was done by making predictions about differences in overt behavior which should logically follow from the different educational environments if the theoretical assumptions were correct.

Since the tendency toward "failure avoiding" in academic performance is assumed to be a function of the overbalance of failure experience in school for the retarded child, it is precisely this overbalance of failure which the special class program is designed to offset. Retarded children in effective special classes should parallel normal children in their personal adjustment while retarded children in regular classes should behave differently. Attempts to evaluate personal adjustment in this project have been made with reference to school-related tasks. On all measures, the special class children were hypothesized to behave similarly to normal children while the control children were hypothesized to behave as retardates reported in the literature.

The sections which follow describe (a) the tendency of educable mentally retarded children in regular classes to experience failure, (b) the investigation of cognitive style, (c) the study of freedom of interaction, and (d) the test of anxiety of special-class and control-group children.

Failure Experience

Some evidence was obtained to support the assumption that retarded children in regular grades are, in fact, exposed to more failure possibilities than their special class counterparts. It was found, for example, that the regular class retardates were studying from readers which were generally above their reading achievement levels while the readers used by the special class retardates were more consistent with their measured achievement. Correlations were computed between level of text used and measured achievement in reading for the experimental and control groups separately. The obtained correlations were +.46 for the controls and +.72 for the experimentals.

Further indications of failure were obtained by noting the achievement scores of the control children with reference to their class peers. The acquisition of class rank data depended upon the administration of academic achievement tests by the public schools since the project staff was not able to test every child in every class where control children were located. Since many schools did not administer achievement tests or administered them only to certain grades, class rank data were not available for all control children. The ranks which are available are based on a variety of tests depending upon the practices of the different schools. The one urban center which provided data on most of the control children and their classes did not do achievement testing during the fourth year of the project. As a result, the class rank data presented here are based on the achievement data obtained during the third year of the study.

During the time that this portion of the study was undertaken the children who had repeated a grade were in the second grade while the children who had not repeated were in the third grade. The data presented in Table 29 show the percentage of children in each quartile for reading and for arithmetic. It can be noted that 58.3 percent of the control children in the third grade were in the bottom quartile in reading while only 28.5 percent of the control children in the second grade were in the bottom quartile. Although some children scored above the median for their classes, the majority of the control children in the study were doing poorly when compared with their classmates.

Cognitive style[1]

The hypothesis tested was that the differences in classroom atmosphere as well as methods of instruction would result in the special class children performing at a higher level on measures of productive thinking. The study of cognitive style was conducted after the second year of the project, using only a selected sample of subjects. A small group who made gains of 10 points in IQ scores over the first two years was included for specific analysis. However, those pupils who scored above 88 IQ on the 1961 Binet test were generally excluded. This investigation, therefore, involved 39 experimental children and 32 control children. A comparison group was selected consisting of 27 normal children of average intelligence and of the same chronological age as the mentally retarded subjects of this experiment.

Six tests, three verbal and three non-verbal, developed by Torrance,

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[1] The investigation of cognitive style was carried out by Tisdall (1962).

Table 29

Percentage of Second and Third Grade Control Children Scoring at Each Quartile in their Respective Classes in Reading and Arithmetic

Subject	N	Quartiles[a] 1	2	3	4
Reading					
Grade 2	28	28.5	28.5	21.4	21.4
Grade 3	24	58.3	25.0	8.3	8.3
Arithmetic					
Grade 2	28	39.3	28.6	14.3	17.9
Grade 3	24	62.5	25.0	8.3	4.2

[a] First quartile is lowest quartile

Yamamoto, Schenētzki, Palamutlu, & Luther (1960) were employed. The verbal tests were scored in terms of originality, fluency, and flexibility. Non-verbal tests were scored for originality and elaboration. A thorough description of the tests, the method of administration, and the scoring procedures may be found in another publication (Tisdall, 1962).

The mean scores for verbal originality, fluency, and flexibility and the non-verbal scores for originality and elaboration are presented in Table 30 for the experimental, control, and normal groups. The experimental and normal groups performed essentially the same on the verbal task and both scored significantly higher than the control group. The non-verbal part of this test did not discriminate the three groups. Thus, the hypothesis was partially supported. The finding that special class retardates and normal children did not differ on these tasks and that both were superior to the regular class retardates is in line with the basic assumptions made previously. It provides partial support for the hypothesis that the special class had a desirable effect on personal adjustment.

The differences in cognitive style between experimental and control groups vary by county. The results on tests or originality, fluency, flexibility, and elaboration of thought for Kankakee County (urban) versus Ford-Vermilion Counties (rural) are presented in Table 31. Because of their similarity in results and small sample size, the results for Ford and Vermilion Counties have been combined in this analysis. On all verbal tests, children in Kankakee County experimental classes were superior to those in the control classes. The results were statistically significant for originality (t = 3.715), fluency (t = 4.302), and flexibility (t = 2.367). There were no significant differences on verbal

Table 30

Means and Standard Deviations of Productive Thinking Scores of the Experimental, Control, and Normal Groups[a]

Groups	Productive Thinking Subtests				
	Verbal			Non-verbal	
	Orig.	Flue.	Flex.	Orig.	Elab.
Experimental (N=39)					
Mean	22.18	14.00	6.51	19.46	13.41
S.D.	10.62	5.70	2.21	5.89	8.79
Control (N=32)					
Mean	17.16	11.06	5.66	18.47	12.09
S.D.	8.12	3.89	2.19	6.30	7.64
Normal (N=27)					
Mean	24.53	14.70	7.15	18.26	13.67
S.D.	9.82	4.23	1.88	7.00	7.47
t ratios					
Exper. vs. Control	2.18	2.62	1.70	-----	-----
Exper. vs. Normal	0.97	0.50	1.22	-----	-----
Control vs. Normal	2.92	2.98	2.74	-----	-----

NOTE.--Table reprinted in revised form from W. J. Tisdall, The Efficacy of a special class program on the productive thinking abilities of educable mentally retarded children. Unpublished doctoral dissertation, University of Illinois, 1962, p. 35.

[a] Analysis based on a one-tailed test.

Table 31

Performance on Tests of Cognitive Style of Children in Experimental and Control Groups, by County

Tests of Cognitive Style	County			
	Kankakee (urban)		Ford-Vermilion (rural)	
	Exp.	Control	Exp.	Control
Verbal Tests				
Originality	29.8	17.8	16.65	16.64
Fluency	18.2	10.8	10.7	11.4
Flexibility	7.5	5.4	5.5	6.0
Non-verbal Tests				
Originality	20.9	20.7	18.2	15.3
Fluency	7.3	5.8	4.1	4.9
Flexibility	5.3	4.5	3.4	4.1
Elaboration	17.2	12.7	11.1	10.9

tests between the experimental and control groups in Ford-Vermilion Counties' data. However, the Kankakee experimental group was higher than the Ford-Vermilion experimental group on verbal flexibility (_t_ = 2.801), originality (_t_ = 4.239), and fluency (_t_ = 4.518). On the non-verbal tests, the results were less conclusive. There were no significant differences on non-verbal tests between experimental and control groups for either Kankakee or Vermilion Counties. However, the Kankakee experimental group was higher than the Ford-Vermilion group on non-verbal flexibility (_t_ = 2.270), and non-verbal fluency (_t_ = 2.560). Moreover, the Kankakee control group was higher than the Ford-Vermilion control group on non-verbal originality (_t_ = 2.596). Thus, there were marked differences between counties and the superiority of the experimental group over the control group was found mainly in Kankakee County on verbal tests of cognitive style.

Freedom of Interaction

This investigation in the area of freedom of interaction focused on the interpersonal interactions through the oral administration of a questionnaire. The purpose of this questionnaire was to determine the extent to which children were willing to attempt answers to difficult questions. It is often the experience of the retarded child that attempts to answer difficult questions result in negative reinforcement. It would thus be anticipated that children who were exposed to a background of failure, as was demonstrated in a previous section for the regular class retardates, would be hesitant to answer such questions while the special class retardates should attempt to answer with less difficulty. When the questionnaire was administered at the half-way point of the study it was found that the special class retardates attempted to answer significantly more of these questions than did the regular class retardates. The identical questionnaire was administered at the end of the study. The results of the two administrations and the summary of the statistical analysis are presented in Table 32. The data from these tables indicate that a significant difference existed between the groups for both administrations and that there was a general tendency to answer fewer questions from the first to the second administration. Although there appears to be an interaction between groups and testing periods, the F-ratio for interaction was not significant. The conclusion from these data is that the special class subjects attempted to answer more questions than did the regular class subjects, thus confirming the hypothesis.[2]

Anxiety

The task of learning to read is assumed to be difficult and stressful for mentally retarded children in general. It was thus expected that evidence of anxiety in performing an academic task could be found by asking children to read while recordings were being made of skin conductance. Each child in the study was tested individually by two examiners. One examiner interacted with the child while the other was responsible for timing and recording the data. The children were given a 10-minute rest period after the electrodes were attached. Then they were asked to read for 8 minutes from a story in a standard first-grade reader, after which they were asked

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[2] Other investigations relating to freedom of interaction and motivation were undertaken and are described in Appendix G. The studies discussed in the Appendix, however, did not involve school-related tasks and, therefore, did not bear directly on personal adjustment in school.

Table 32

Mean Number of Items Attempted on the First and Second Administrations of the Response Set Questionnaire for Experimental and Control Groups

Groups	Initial Test	Second Test
Total Groups[a]		
Experimental	(N=38)	(N=40)
Mean	15.51	13.24
S.D.	5.10	5.64
Control	(N=50)	(N=52)
Mean	12.80	12.32
S.D.	4.47	3.60
High-IQ Groups[b]		
Experimental	(N=20)	(N=22)
Mean	15.35	13.73
S.D.	4.38	4.84
Control	(N=34)	(N=35)
Mean	12.50	12.34
S.D.	4.33	3.05
Low-IQ Groups[c]		
Experimental	(N=18)	(N=18)
Mean	16.50	13.39
S.D.	5.86	3.19
Control	(N=16)	(N=17)
Mean	13.44	12.35
S.D.	4.83	4.53

[a] Difference between total experimental and control groups significant beyond the .05 level (F = 9.169 with 1 & 86 df) for initial test.

[b] Difference between high-IQ experimental and control groups significant beyond the .05 level (F = 5.410 with 1 & 50 df) for initial test.

[c] Difference between low-IQ experimental and control groups not significant (F = 2.721 with 1 & 32 df) for either initial or second administration.

to read for an equivalent period of time from their own readers. The story selected from their own texts was always the next one to follow the one they were currently working on in class. The sequence of reading materials was systematically varied so that order effects could be accounted for statistically.

No significant differences were found between the groups on this task. It was concluded that there was no difference in level of skin conductance for the two groups under either reading condition and therefore probably no difference in degree of anxiety experienced.

Summary of Findings on Success Approaching and Failure Avoiding

The hypothesis tested was that children in the special class would show a greater degree of success approaching and a lesser degree of failure avoiding than children in the control group. Success approaching was evidenced by originality, fluency, and flexibility in thought, greater freedom of action in which the individual risks being wrong, and a lower degree of anxiety in performing school-related tasks. Evidence was presented that the control children faced many possibilities of failure in their school work. The findings were as follows:

1. The children in the experimental group scored consistently higher than children in the control group on verbal tests of originality, fluency, and flexibility of thought. This superiority of the experimental group children, however, was found only in Kankakee County.

2. The children in the experimental group took greater risks in being wrong by attempting to answer a greater number of difficult questions in an orally administered questionnaire.

3. There were little differences between the experimental and control group in the level of skin conductance during oral reading. Both revealed about the same amount of anxiety in performing this task.

Summary

This chapter has presented findings relevant to the hypothesis that educable mentally retarded children placed in special classes will show a more adequate social and personal adjustment than will similar children placed in regular classes.

Results on three aspects of adjustment have been reported: (a) parents' views of their children, (b) the child's relationships with neighborhood peers, and (c) success approaching and failure avoiding in school.

Since parents' opinions of their young children are ordinarily influential in the development of the child's self-concept, the mothers' impressions of their children were ascertained. In general, the experimental group mothers rated their children as more able and more adequate in school learning, quickness in perception ("catching on"), and reading and arithmetic performance than control group parents. The results on mothers' impressions of their children's reading abilities were equivocal. The mothers of the control group children thus showed more derogation of their children than did mothers of experimental group children.

Sociometric analyses have indicated that the educable mentally handicapped child in the special class is less rejected and/or isolated in school than is the educable mentally handicapped child in the regular classroom. Little is known, however, of relationships outside of school. Neighborhood relationships of a small sample drawn from the control and experimental groups of children residing in Kankakee were investigated. Little overt rejection of either experimental or control group children was expressed by the normal children in the neighborhood. However, normal children in the neighborhood appear to play somewhat less frequently with experimental group children than with those in the control group. In spite of the difference in frequency of play, the children in the experimental and control groups were about equally known to others in the neighborhood and children in the experimental group were more able to remember names of other children than were control group children.

The concepts of success approaching and failure avoiding have been developed to indicate how children who have received positive reinforcements (or negative reinforcements) in their past experience in particular situations will behave in the future in these situations. The child who has received positive reinforcement will take many risks in being wrong, will try to devise new ways of successful performance, and will have a low anxiety in these situations. On the other hand, it can be hypothesized that the child who has received predominantly negative reinforcement will look for ways of avoiding failure. He may try to meet only minimum standards, may not be motivated to seek new patterns of behavior, and may display much anxiety. Tests were administered to determine whether children in the experimental group performed school-related tasks success-approaching ways to a greater extent than did children in the regular classes. In Kankakee County, children in the experimental group scored consistently higher than children in the control group on verbal tests of originality, fluency, and flexibility of thought. In all counties, children in the experimental group took greater risks in being wrong by attempting to answer a greater number of difficult questions in an orally administered questionnaire. There was, however, little difference in anxiety between the control and experimental groups on oral reading. Thus, except for the reading test for anxiety, the findings on performance of school-related tasks indicates a greater tendency on the part of the special class children to be success approaching.

Generally, the findings supported the hypothesis that the experimental group children would show a greater degree of personal adjustment than would the control group children.

SUMMARY AND CONCLUSIONS

The purpose of this study was to compare the intellectual development, academic achievement, and social and personal adjustment of educable mentally retarded children in special classes with those in regular grades. The study was designed to compensate for methodological inadequacies of previous investigations which showed the following deficiencies: (a) lack of control over sample selection, (b) effects of the varying school experiences prior to special class placement, (c) lack of specification and control over the special class educational program, and (d) discrepancies between the goals of the special class and measures of effectiveness.

The major hypothesis in the investigation was: The placement of educable mentally retarded children in special classes at the beginning of *their school careers*, with specially trained teachers and an optimal special program, will have a more positive effect on their rate of intellectual development, academic achievement, and social and personal adjustment than will continuation in the regular public school classes.

To test this hypothesis, special classes were established in three Illinois counties which previously had had no special class provisions for primary age educable mentally retarded children. All children (approximately 2,000) who were beginning first grade in these counties were screened by means of the Primary Mental Abilities test. The Stanford-Binet Scale was administered to those children who scored below 85 IQ. The 129 children who scored within the range of 56 to 85 IQ on both tests were divided into two groups by random procedure. Those in one group were placed in special classes while children in the other group entered the regular first-grade classes. A series of intellectual, academic, and personal adjustment measures was administered annually to all children. The teachers in the special program had all received bachelors degrees in the education of the mentally retarded. The *Illinois Curriculum Guide for Teachers of the Educable Mentally Handicapped* (Goldstein & Seigle, 1958) formed the basis for the educational program during the four years the special classes were in operation.

The findings on the evaluation measures relating to intellectual development, academic achievement, and social and personal adjustment are summarized below. In spite of the attrition to about three-fourths of the original sample, an analysis of the characteristics of the children who left the program indicated that the results of the study were not significantly affected by this attrition.

Intelligence

The analysis of data on intelligence tests revealed the following results:

1. Both the experimental and control groups increased significantly on intelligence test scores. The experimental group gained seven IQ points, while the control group gained eight IQ points during the course of the study.

2. The gains in IQ occurred primarily during the first year of school experience.

3. There was no statistically significant difference in IQ gains between those who attended special classes and those who remained in the regular grades.

The results on intelligence test increases did not support the hypothesis that special class enrollment will result in greater IQ gains than will enrollment in regular classes.

Although the hypothesis was not supported, the interesting result was the significant increase in IQ for both groups. In addition, the case data showed that within the two groups some children increased in IQ and others did not. As a matter of fact many of the children in both groups increased in IQ sufficiently to declassify them as mentally retarded even with a criterion of 85 IQ and below. The consistency of increases in IQ of this study and those of Kirk (1958) and Smith & Stroud (1960) reduces the probability that the gains in IQ scores can be attributed to the unreliability of the initial tests.

Increases in IQ during the course of the study might be accounted for by variables not related to school experiences. These will be discussed below in terms of (a) comparison of high- and low-IQ groups, (b) effect of retention in first grade, and (c) social factors.

Comparison of High- and Low-IQ Groups

The analysis of the group in terms of high IQ (IQ's above 80) and low IQ (IQ's below 80) indicated that initial IQ has some effect on the increases in IQ regardless of the treatment (special class or regular class). Children with high IQ's (IQ's above 80) had a mean initial IQ of 76.32 (standard deviation = 6.65) for the experimental group and 78.86 (standard deviation = 3.77) for the control group (Table 14). The two groups increased in IQ to 89.09, and 89.60, respectively. In contrast, the low-IQ group had an initial IQ of 71.74 (standard deviation = 7.45) for the experimental group and 72.94 (standard deviation = 7.54) for the control group. For these two groups there were no consistent increases in IQ; their final mean IQ's were 71.67 and 71.47, respectively. One may hypothesize from these data that children who are in the traditional borderline range (75 to 85 IQ) are more likely to increase in IQ than those in the more traditionally defined group of the educable mentally retarded (60 to 75 IQ). This is one variable that may be considered in the assignment of children to special classes at the age of six.

Retention in Grade

About half of the control children were retained in the first grade and the other half were promoted to the second grade. Those who were retained showed little IQ increase during the second year, but their rate of intellectual functioning improved during the third year, that is, after being placed in the second grade. Those control group children who had not been retained in the first grade made steady increases in IQ scores.

The lower rate of mental growth of those children who were retained in the first grade as compared with the steady rise in mental age of those who were promoted can be interpreted in either of two rival hypotheses. The first interpretation is that the repetition in subject matter when the grade was repeated precluded the intellectual stimulation required for continual increase in mental age. The interpretation is supported by the finding that the children increased in rate of intellectual growth when they finally were promoted. The second interpretation is that each child develops according to his own growth curve. Inasmuch as the children had been retained in the first grade, apparently the teachers thought that the children were not learning the required material. This failure to learn first-grade material could have resulted from a plateau in the child's learning curve. The correctness of interpretations must await further investigations.

Social Factors

Several social factors were found to be related to increases in IQ. Children whose IQ's rose at least 10 points during the course of the study tended to come from families with the following characteristics: (a) Caucasian, (b) higher index of marital integration, (c) mother in her first marriage, (d) mother with more than eight years of schooling, and (e) higher participation with friends and with neighbors.

These characteristics which differentiated the children whose IQ's increased at least 10 points from those whose IQ's remained constant or declined are similar to the characteristics which differentiated between the retarded children and a group of normal children of comparable socio-economic status. Compared with the normal children, the retardates came more often from homes with less adequate resources and where family relationships were less stable. Their parents generally had less education. There were, on the average, more children and adults in the homes of the retardates, but less living space per person. The families of the retardates were less integrated into the community and were more highly mobile.

The findings on the children who increased significantly in IQ suggest that (a) there was greater stimulation and consistency in family and community relationships of the children who rose in IQ, but (b) perhaps, without the school, these family and community factors would not have been sufficient for the child to develop intellectually in the normal range. The school environment, then, provided the additional stimulation and consistency in social relationships which enabled the child to function at a higher level intellectually. Although these findings suggest that the school can help the children from families which are only slightly deficient in intellectual stimulation and stability, they do not indicate which supplementary practices can raise the level of intellectual functioning of children from homes which are grossly stagnating and unstable.

Academic Achievement

The children in the experimental and control groups were tested for academic achievement in three areas: reading and language, arithmetic, and basic social information. For the total group there were no significant differences in any of the three areas of academic achievement between the experimental and control groups. The slightly higher achievement of the control group was offset by a somewhat higher IQ-MA. Thus, the hypothesis that educable mentally retarded children in special classes will achieve at a higher level was not upheld.

Since some of the children had obtained IQ's which were above the commonly accepted range for the educable mentally retarded, separate analyses were made for children with terminal IQ's of 81 or above, and for those with IQ's of 80 or below. Inasmuch as the curriculum developed for the study was aimed at educable mentally retarded children, the results for the low-IQ children were considered more meaningful than those for the total group or those for the high-IQ children in evaluating the efficacy of special classes. The results of these analyses were as follows:

1. For the children with IQ's of 81 and above (high-IQ group) the control group attained slightly higher academic achievement scores in all

three areas than did the experimental group, but the differences between groups were not statistically significant.

2. Among the children with an IQ of 80 or below (low-IQ group), the experimental group tended to exceed the control group in all three areas. Most of these differences were statistically significant. Thus, for the low-IQ group (those resembling mentally retarded children in special classes) the achievement hypothesis was upheld.

The results of the analysis of academic achievement given above indicate that (a) the special class is beneficial to children whose IQ's are 80 and below, but that (b) the special class is not necessarily an effective educational setting for significantly improving academic achievement of children who have IQ's above 80, usually classified as borderline or slow learners. If this result is substantiated it would imply that special classes should be confined to serving children with IQ's below 80 rather than children with higher or borderline IQ's.

It is reasonable to assume that in a special class with a range of abilities as in this study, the teacher's concern will be with those children who are having the most difficulty in making progress in the educational program. Thus, much of the teacher's attention and planning will be directed toward the low and moderate performers. The more able children will receive some, but proportionately less, attention and will more often be left to their own devices. This reduction in stimulation will tend to keep the more able children from progressing at a rate commensurate with their ability.

Similarly, the low-IQ child in the regular class receives less attention. With time, he falls so far behind his normal peers that the educational program becomes irrelevant to his status as a learner. At the same time, his needs are in such contrast to those of his peers that he requires a distinctly different program and method of instruction. In the usual regular class, this becomes difficult if not impossible to develop and implement because of the large array of demands on the teacher's time and energies. In this situation, it is the low-IQ child who is under-stimulated, whereas the child of 80 IQ and above receives some stimulation from the regular class.

Reading Readiness

Another finding that required an explanation was that during the first year the control children were significantly superior to the experimental group in reading, even though during subsequent years the experimental children caught up to the control group. This finding appeared to be related to differences between the instructional programs of the two groups. In the special class the entire first year was devoted to a reading readiness program, while in the regular grades the control group was exposed to the first-grade reading program. As a result, the control group exceeded the experimental group on reading tests at the end of the first year. This result raises the important question as to the appropriate balance between a readiness program and direct reading instruction at the age of six, even though the children's mental ages are four or five. It would appear from the results of this study that a reading readiness program is not as effective as direct instruction in the early process of reading if the readiness program continues beyond its usefulness. It should be remembered that beginning reading instruction includes the perceptual and conceptual training that is part of the reading readiness program.

Arithmetic

In arithmetic achievement, the low-IQ experimental children were significantly superior to their counterparts in the control group on both computational skills and on problem solving. For the high-IQ children, the control group was somewhat higher (but not significantly) than the experimental group on both computational and problem solving skills.

The emphasis in the special class method used in this study was on the teaching of academic subjects as a means for developing ability in problem solving. This may have been responsible for the findings on arithmetic achievement. The data suggest that despite the traditional belief that retarded children are deficient in reasoning, potential ability for problem solving is present but requires systematic teaching of quantitative concepts and processes in order to be developed. It is also of note that although the low-IQ experimental children exceeded their counterparts in the regular classes in arithmetic computation and problem solving, there was no difference between the two groups in intelligence test scores. Evidently both groups had reached their peak in intellectual ability, but the special class children had learned techniques of problem solving which were unfamiliar to the regular-class group.

Social Knowledge

On the Test of Basic Information, developed to measure social knowledge of children in the primary grades, the low-IQ experimental children were superior to the low-IQ control children. There were no marked differences between the high-IQ experimental and control group children.

One assumption underlying the social studies program in the special class curriculum was that young retardates need to acquire a thorough understanding of their immediate physical and social environment before they can comprehend adequately the more abstract characteristics of their family and community settings. The Test of Basic Information samples knowledge about the dominant culture of the community as it impinges directly on the children.

The findings on the Test of Basic Information suggest that special class programs which emphasized basic social knowledge were effective for low-IQ children.

Social and Personal Adjustment

Personal adjustment of the experimental and control children both in school and outside of school was considered. Parents' views of their children, the children's relationships with neighborhood peers, and their success approaching or failure avoiding in school were investigated. The major results of this aspect of the study include:

1. Experimental group mothers tended to see their children in a less derogatory manner than did control group mothers in comparing their children with other children on school learning, quickness in "catching on," ability to do numbers and in reading by themselves. The findings on reading by themselves were more equivocal than were those on other topics.

2. On neighborhood sociometric studies it was found that (a) the control children tended to interact to a slightly greater degree with other children than did the experimental children, and (b) neither group was overtly rejected by the other children in the neighborhood.

3. The experimental group exceeded the control group in (a) greater originality, flexibility, and fluency in productive thinking on verbal tasks, but not on nonverbal tasks; and (b) freedom of interaction as determined by risk taking in answering difficult questions. There were no differences in anxiety levels in reading situations as measured by skin conductance.

Although the findings on personal adjustment in schools were not unequivocal, they suggested that the special classes encouraged the retardates to display originality and flexibility in their thinking. This encouragement perhaps stemed from the emphasis in the special class program upon the teaching system and training in problem solving. An emphasis upon individual initiative, taking risks in being wrong when trying out solutions to problems, and the formulation of unique solutions to classroom problems require a carefully managed classroom atmosphere with little interpersonal tension. Apparently, this atmosphere, as it impinges upon the retarded child, is more readily attained in the special class than in the regular class. Very likely, the equivocality of the findings reflects the limited competence of the retardates to engage in highly productive thinking.

Ordinarily, educable mentally retarded children are considered rigid, unimaginative, and lacking in originality. In the regular classroom, there is evidence that educable children tend to be rejected and are frequently sociometric isolates (Johnson, 1950; Johnson & Kirk, 1950). The findings in this investigation suggest that the interaction in the special class is freer and social relationships are not as structured as they are in the regular classroom. As a result, there is probably less rejection and sociometric isolation in the special class than in the regular classroom. Possibly, this difference in the structure of classroom relationships results from the lesser emphasis upon academic achievement in the special class and greater stress upon cooperative problem solving. Very likely, the greater the emphasis upon academic achievement, the greater is the differentiation among the members of the class on the basis of achievement and personal characteristics. Hence, the differences in aims between the special class and the regular class seem to facilitate the personal adjustment of the retardate in the special class while impeding his adjustment in the regular class.

Educational Implications

The results of this study have implications for educational programs for the educable mentally retarded in the following areas: (a) placement policy, (b) program, (c) teaching method, and (d) teacher preparation.

Placement Policy

Few special class programs admit children at the age of six years. More often than not, the reason given is that intelligence tests are not sufficiently reliable by themselves to influence a definitive decision on the disposition of young children. The corollary to this is that allowing the child to continue in the regular grades will provide for an accumulation of academic and/or behavioral evidence that will validate the results of intelligence tests. At the same time, most educators agree that the experiences of the retarded child in the regular class rarely lead to a healthy attitude toward schooling and school personnel.

The results of this study suggest that the probability of a rise in intellectual functioning following school entrance is greater among children above 75 IQ (Binet) than among those with lower IQ's. Children with an IQ above 75 are also more likely to sustain any gain in intellectual functioning, as indicated by tests at the end of the fourth year. Hence, there appears to be some justification for children with a Binet IQ below 75 being placed in a special class at the beginning of their school career and for children with scores of 75 or above entering the regular school program. Because of individual variation in IQ from year to year, however, especially those children in the 71-79 IQ range should be retested annually.

One of the reasons given most frequently for delaying placement of young children in special classes for the educable mentally retarded is that the youngster placed in a special class acquires an undesirable label. It is contended that this label will remain with the child who goes back to the regular class. In this study, three children in the experimental classes scored within normal IQ limits at the end of the first year. They were retained in the special class for an additional year and were engaged in an enriched program to prepare them for return to the regular grades. At the beginning of the third year, they entered the third grade in their neighborhood school and were assimilated into their class almost immediately and without stigma. While this experience is based on a limited sample, it is interesting to note that the experiences were identical for all three children.

Careful selection at age six, assignment of only children with IQ's 75 or less to special classes, and careful observation and evaluation are requisites of early placement of educable mentally retarded children in special classes. Early placement opens to the child immediate involvement in a program and setting consistent with his abilities and needs.

Program

There are two implications for educational programming for the young educable mentally retarded. The first has to do with the concept of readiness, the second with balance in academic learning and learning in the area of social and personality development.

This study does not raise questions as to the intent or structure of reading readiness programs. It does raise a question, however, concerning the extent of reading readiness programs and their implicit separation from reading as a process.

In many classes, readiness for reading is viewed and treated as though it were a separate process from actual reading. It is felt that children must demonstrate substantial competencies in visual and auditory perception and in verbal and motor expression, usually with ambiguous stimuli, before coming to grips with the abstract symbols of reading. This assumption underlies the full year of readiness activities occupying the entire first year of this study. The performance of the control children in the evaluation of reading at the end of the first year, however, brought into focus the fact that the conceptual and perceptual exercises in learning a new word may have as much or more value to the child as differentiating an equilateral triangle from a right triangle or an oval from a circle.

Experience and data suggest that at some point in each child's development there needs to be a smooth transition, and probably some overlap, from readiness activities to the learning of new words and their meanings. At what point in time this transition becomes appropriate is subject to study. In any case, ignoring this fact and adhering to a schedule based on performance criteria can delay reading unnecessarily.

With reference to programmatic balance, one often finds one extreme or the other being practiced in special classes for elementary-age educable mentally retarded children. At one extreme, the class is engaged almost exclusively in routine academic learning with periods of arts and crafts distributed through the day to relieve the strain and pressure. The other extreme is a substantial de-emphasis on academic learning but much concentration on pleasurable activities that will lead hopefully to good mental health.

The results of this study indicate that the special class need not be an either/or situation. Young retarded children can learn academic subjects, provided that the reading, arithmetic, and social studies programs are relevant and the teaching method consonant with the learning characteristics of the children. At the same time, educable mentally retarded children can develop positive attitudes about themselves, their peers, and the school as a setting, provided that learning to read and to reckon are rewarding in as many ways as they need to be. To put it another way, the classroom need not be the scene of innocuous failure-free activities. Educable mentally retarded children probably can profit from a balanced program of academic and social learnings if their learning and behavioral characteristics are assessed carefully and then integrated into the planning for the program.

Teaching Method

Frequently, educable mentally retarded children are characterized as having difficulty in coping with abstractions. This has led many teachers to believe that instruction of these children should be limited to facts and to rote-learned rules of behavior. The teachers in this study demonstrated that educable mentally retarded children can learn problem-solving principles in such a way that transfer and generalization take place. By adhering to an inductive system of teaching that involved the children as active participants in the learning task, the teachers were able to inculcate in the children a style or approach to tasks that was evaluative and respectful of alternatives and results. This system of teaching leads to greater flexibility and fluency in language and behavior than might be expected from a fact-dispensing, behavior-conditioning system.

Teacher preparation programs should take these results into account and students should be helped to develop a consistent system for interacting with children in all learning settings--academic, social, or recreational. If academic subjects are recognized as means toward an end as tools in problem solving, children will be taken beyond the manifest skills stage of word recognition and oral reading into problem-solving tasks where reading becomes one step in a total procedure for arriving at a solution to a meaningful problem. The same can be said for arithmetic computation as one step in solving a quantitative problem.

Teacher Preparation

Many teacher preparation institutions and administrators of special class programs feel strongly that teachers of the retarded need two or more years of teaching experience with normal children as a prerequisite to teaching the retarded. As a result, many teacher preparation programs are post-baccalaureate and a large source for new teachers from undergraduate programs is almost untouched.

Until recently, there has been no evidence to support either side of this question. The arguments of those who subscribe to the regular class prerequisite is as sound logically as those of the protagonists of the undergraduate programs. In this study, none of the ten teachers had experience in teaching so-called normal children beyond that portion of their practice teaching which called for teaching in the regular grades before practice teaching with retardates.

In all probability, the major issue is not experience or lack of experience with one type of child or another. It probably is centered around the nature and efficacy of the teacher preparation program as such as well as the type and amount of supervision the teacher receives on the job. Obviously, teachers receiving undergraduate preparation can be productive and effective teachers and, like all teachers, need and seek constructive supervision. Just as obviously, undergraduates in colleges of education constitute a large and rich resource for teachers of retarded children providing that an active, enlightened program of recruitment is instituted and an effective program of teacher preparation is designed and implemented for undergraduates as well as re-trainees.

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APPENDIX A

The Educational Program[1]

The review of studies on the efficacy of special class placement and of other research pertinent to this problem have shown that little attention has been given to such important variables as the methods and goals of instruction, the curriculum, the qualifications of the teachers, and the role of supervision. These factors, along with selection and evaluation, were considered an integral part of the design of this study in that they constitute the treatment phase.

The educational program of the four experimental classes was based on the State of Illinois publication, A Curriculum Guide for Teachers of the Educable Mentally Handicapped (Goldstein & Seigle, 1958). This guide was developed and had become available for general use just prior to the beginning of the study. The major premise underlying the curriculum is that all citizens in a democratic society face certain persisting life problems. How well these problems are solved represents the extent to which the individual is able to cope with his physical, social, and psychological environment. The problem areas of the Curriculum Guide are considered under the headings of (1) citizenship, (2) communication, (3) home and family, (4) leisure time, (5) management of money and materials, (6) occupational adequacy, (7) physical and mental health, (8) safety, (9) social adjustment, and (10) travel. In structure, the Curriculum Guide is organized so that all elements of the school program are focused on these life problem areas.

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[1] Prepared by Dr. Laura J. Jordan of the project staff.

Each of the problem areas is clarified by a listing of the objectives it includes; such as, under Occupational Adequacy are found "Personal Competencies for Working," "Social Competencies for Working," and "Academic Competencies for Working." These objectives are further broken down into sub-goals which are less abstract and of manageable size for classroom planning; work habits is a sub-goal of "Personal Competencies," and is itself subdivided into care of equipment, conservation of materials, organization of time and effort, attention to safety, and regular and punctual attendance.

To aid the teacher in planning for each area, suitable motivating activities and correlated activities in language arts, arithmetic, unit work, and fine and practical arts are suggested at the primary, intermediate, and advanced class levels. In Figure A-1, a page from the area of Occupational Adequacy is reproduced showing some of the suggested ideas for implementing the work habits and self-care phases of "Personal Competencies for Working" at the intermediate level.

Another section of the Curriculum Guide lists the learnings for each of the several areas of knowledge in a developmental order keyed to the same three levels of difficulty. This provides for each age level a checklist of what the children should be learning, while the developmental order is to insure the previous teaching of the basic skills and knowledge necessary to the mastery of each new topic. These learnings are organized separately for the areas of arithmetic, language, science, social relationships, fine and practical arts, and physical education.

From this it can be seen that the Curriculum Guide provides a socially-oriented curricular framework and a course of study for the

Figure A-1 Illustrative Excerpt from the Curriculum Guide[a]

OCCUPATIONAL ADEQUACY (Intermediate) 91

OBJECTIVES	MOTIVATING ACTIVITIES	CORRELATIONS			
		LANGUAGE ARTS	ARITHMETIC	UNIT ACTIVITIES	FINE and PRACTICAL ARTS
	Display of pictures to illustrate various work habits Film on use of tools	Discussion: •use and care of material and equipment •why and how we plan the day's work •value of starting and completing each task within the planned time Read: •experience chart about the use and care of equipment •daily plans •directions for tasks Write and read: •names of equipment •sentences in regard to use and care of equipment •rules of safety Spell: •common words in units	Time: •hour, half hour, period of day •time school starts, recess, lunch time, end of school day •concept of punctuality Compute: •cost of tools and equipment Money: •problems relative to buying and selling tools •make a list of tools with price	Health: •mental health factors in well organized work plans Science: •identification and classification of tools •care and use of tools Safety: •safety rules relative to different kinds of work	Posters to illustrate care of tools Make safety slogans Construction of clock Make a scrapbook of various classifications of tools with labels, i.e., garden, carpenter, kitchen
PERSONAL COMPETENCIES FOR WORKING	Film on grooming Film on good health habits Discussion on knowing yourself	Discussion: •differences in individuals' looks, health, behavior •advantages of being different •value of understanding our differences Write and Read: •list tasks which they do best •tasks in which they think they need to improve •rules on courtesy and good manners Dramatization: •use of good manners Read: •book relative to unit activities	Meaning and use of terms: •measurement such as inch, foot, yard, tall, short •weight such as pounds, ounces, light, medium, heavy	Health: •effect of personal cleanliness in relationships with others •mental health factors in grooming •mental health factors in acceptance or rejection of others Physical Education: •exercises and games which help develop physical fitness	Make a mural showing sequence of health habits practiced during a day Scrapbook of appropriate clothing for various kinds of work and for school Make a display of health posters Practice habits of cleanliness at school

[a] Goldstein, H., & Seigle, Dorothy. The Illinois plan for special education of exceptional children: a curriculum guide for teachers of the educable mentally handicapped. Ofc. of the Supt. of Public Instr., Circular series B-3, No. 12. Danville, Ill.: Interstate Printers & Publishers, 1958. P. 91.

educable mentally retarded at each age level. It does not prescribe the method by which the learnings are to be taught other than that suggested by the integration of the academic subjects into a common theme in the life problem areas.

The instructional plan for the four years of the educational program provided for one year of intensive instruction in readiness (because of the children's low mental ages on school entrance), and three years of work in social and academic learning. Using the Curriculum Guide as a base, the experimental class teachers and project staff specified the instructional program, with necessary allowances for differences between the classes, through summer pre-planning and evaluation, and through in-service meetings during the school terms.

Readiness Program

The pre-academic readiness program was organized on the basis of Thurstone's model for the Primary Mental Abilities test for ages 5-7 (Thurstone & Thurstone, 1953), with work in the areas of verbal ability, perception, quantitative thinking, motor skill, and spatial relationships. The teachers developed group and individual lessons in each of these, along with reinforcing activities for each area. Work in the development of cognitive skills, the area of particular handicap for the retarded, was also made a part of the readiness program, while the immaturity of the group dictated a need for training in socialization.

Verbal Training. The verbal exercises were planned to improve the children's ability both to express themselves and to comprehend ideas expressed in words. These included such activities as hearing and retelling stories, recounting personal experiences, discussing pictures, films, and fieldtrips, marking picture worksheets in response to verbal commands, naming objects and pictures or making up sentences about them, and dictating original stories. The principles governing two types of verbal activities, one in speaking and one in listening, are described here.

a. Discussion Periods. Because class discussions in the abstract are seldom successful with the retarded, pictures, stories, games, and films were used as focal points for discussion in order to provide the children with something to say. Teaching guides for discussions were:

1. Keep the discussion short.
2. Ask questions which elicit more than one-word answers.
3. Probe beyond the initial response to check completeness of concept.
4. Start with an object, story, or picture, but relate the discussion directly to the children's own experiences.
5. Avoid letting the more verbal children carry the discussion completely.
6. Wherever possible, have the discussion lead to action.

b. Critical Listening. When a lesson is conceptually demanding, instructions should be unobtrusive and standardized. To encourage purposeful listening, however, varying the instructions adds challenge to review activities. For the latter purpose, children provided with a page of pictures might be told not simply to find the tree, table, calf, etc., but to put a red ring around the tree, a blue line under the table, and a green X on the calf. Besides supplying extra drill on color names and prepositions, such instructions give practice in rapid change of set.

The experience chart stories, made up by the children about their own activities, not only were a preparation for reading and a practice in the cognitive skills (both of which are described under the appropriate heading), but were also predominantly verbal activities and considered an integral part of the verbal training.

In this as in the areas of the other four mental abilities, The Red Book from the Learning to Think Series (Thurstone, 1948) provided valuable sample exercises which were supplemented freely with teacher-made materials, both to build in intermediate steps and to provide sufficient practice.

Verbal skills received heavy emphasis throughout the four teaching years. Discussion topics and specific vocabularies varied, particularly between the rural and urban classes, to meet the needs and experiences of the children. As the skills developed they were reinforced in the appropriate areas of learning.

Perceptual Training. Work in perception had as its goal quick and accurate recognition of similarities and differences in symbols, objects, and words. The readiness training emphasized the visual and auditory senses, the two major avenues of instruction.

Visual discrimination began with comparisons between the children themselves and how they differed or resembled one another as to relative size, clothing, or color of hair and eyes. Three-dimensional objects and then paper cut-outs were compared for size, shape, or color. Worksheets presented pictures which differed in size, shape, or directional orientation, in outline or in detail. These exercises ranged from simple exercises with familiar pictures to the more difficult abstract shapes for which they had no helpful labels. As understanding of the task increased, the number and size of the differentiating cues were decreased until the children were differentiating letter groups (as patterns without intrinsic meaning) in preparation for developing a sight vocabulary. As an example of such cue reduction, the words yellow and is are easily differentiated because (1) yellow is noticeably longer, (2) it has tall as well as short letters, and (3) the two words share no letters. On the other hand, come and came are differentiated only by o and a, and in manuscript writing these letters are very similar. The number and obvious nature of the cues have both been reduced.

In practicing visual discrimination the progression of difficulty was the following (the principle of cue reduction being used at every step):

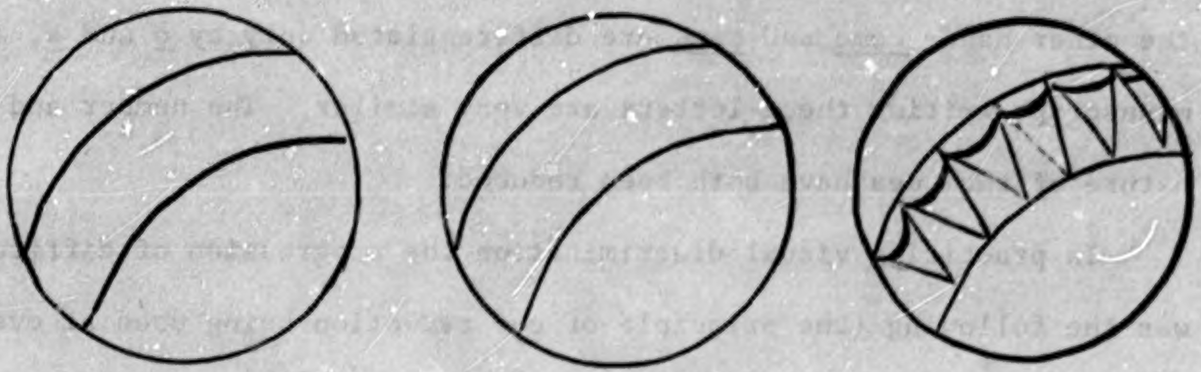
a. Differentiating three-dimensional objects
b. Differentiating pictures of real objects which the children could name
c. Differentiating abstract shapes and free forms for which the children lacked names
d. Differentiating objects unlike in directional orientation only
e. Differentiating objects unlike in internal detail only
f. Differentiating letters and letter groups

Figure A-2 illustrates discrimination exercises employing differences in orientation and in internal detail.

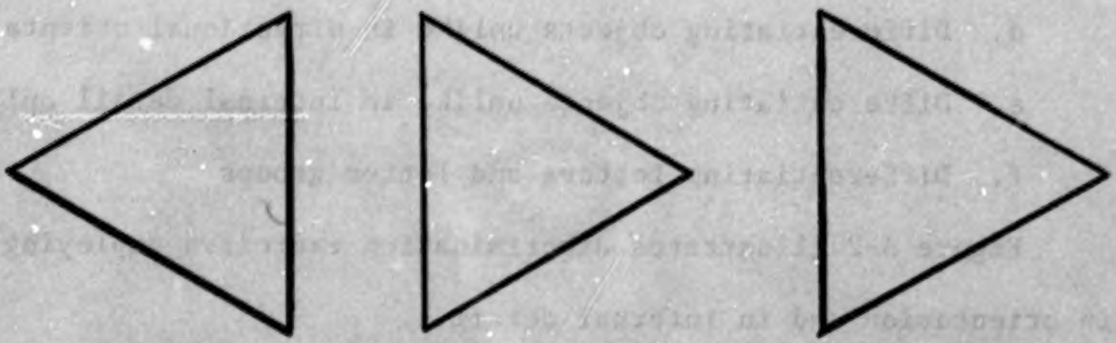
Visual discrimination, to be useful, must be teamed with the ability to remember what is perceived. In the development of sight vocabulary, a lack of visual memory makes necessary a constant relearning of words with minimal profit from past lessons, even where visual discrimination is good.

Figure A-2

Differences in Internal Design and in Orientation



Internal Difference



Difference in Orientation

Practice in visual memory followed the pattern of presentation of a visual stimulus which was then removed from view, while the child was asked to describe or reproduce what he had seen. If the response was incorrect, the original stimulus was presented again to let the child check his own errors. The following types of exercises will illustrate this paradigm.

a. Bead stringing. Large wooden beads varying in color and/or shape were strung in a pattern which was displayed briefly; then it was removed while the child attempted to duplicate it from memory with another set of beads. The two strands were then placed side by side to allow the child to check his work for accuracy. Patterns ranged from the obvious to the intricate, and using a single color with varied shapes or a single shape with varied colors (cue reduction) notably increased the difficulty.

b. What Did I Do? A series of familiar small objects, all different, were placed on the table. The children looked, then closed their eyes while one object was removed. Opening their eyes, the children had to rely on visual memory to tell what object had been hidden. Difficulty was increased by using more objects, or by exchanging the positions of certain objects rather than removing them.

Auditory discrimination and memory, or observing and remembering small differences in sound, were regarded as necessary for improving verbal skills and providing a basis for later phonic word analysis. After learning to notice and identify differences in the pitch, rate, and intensity of sounds, lessons proceeded through the discrimination of like and different word pairs to discrimination of sounds in the initial, final, and medial positions. Recognition is easier than recall; the ability to discriminate between the words he hears precedes the child's being able to supply on demand a word containing certain sounds. Thus, the teacher supplied the words at first, asking whether each contained a given sound. Once this was mastered, the child was asked to give a word incorporating the designated sound. This pattern was followed through each step of auditory training. Auditory memory was further exercised through carrying out a series of verbal commands in order, working according to plans made or oral instructions given at an earlier time (the time lag varied from a few minutes to recall from the previous day), identifying blindfolded the source of familiar sounds, and learning songs by rote. The first level of Learn To Listen, Speak and Write (Monroe, Nichols, Greet, & Gray, 1960) was a source of useful and original activities for the refinement of auditory perception. Individual worksheets from sets, entitled Useful Language, Beginning Sounds, and Rhyming, published in ditto master form by The Continental Press, Inc. (1958), were also used.

Quantitative Skills. Readiness in this area began with rote counting, continuing through the first number concepts and recognition of the number symbols to ten. A beginning was made in teaching the vocabulary of measurement, as how many, later, or more. Three-dimensional objects which could be moved from one place to another as they were counted were used for early practice in rational counting. From this point the children always counted for the purpose of finding an answer, for the sake of meaning. In number symbol recognition, number lines and charts relating number symbols to their pictured quantities were provided to allow the children to identify any number they did not know, to check their own answers, and to correct their own errors. This was to develop self-criticism, increase meaning, and accordingly reduce dependence on authority (the teacher). The simplest time concepts were taught in the context of the daily opening exercises. These exercises included an extended recognition of the date and season, and the planning of activities for the morning, noon, or afternoon, now and later. Coin recognition was begun with the concept of money as a medium of exchange, and in learning the names of coins without regard to value. Much of the practice in number recognition was incorporated into other areas, as counting how many sheets of paper were needed for an art project, or weighing and measuring the children in a health lesson. The emphasis throughout was on comprehension of the usefulness of numbers, in order to build the foundation for the subsequent arithmetic program to be based on comprehension of process rather than on rote learning.

Most of the children moved into first-grade number activities after a readiness period shorter than that required in other areas. This was presumably due to the relatively less abstract quality of number work.

Motor Training. Exercises in motor training were to further the eye-hand coordination basic to speed and accuracy in writing and in the other manipulative skills important in the school. There were exercises in following angular and spiral dotted line patterns with a pencil for practice in reversing direction, making smooth curves, and establishing straight line control. For those with unusual difficulty in motor control there were heavy stencils cut from bristol board, peg boards, bead stringing, and commercial games designed to develop manual dexterity.

Motor exercises were commonly integrated as a part of writing practice. There were also tracing and coloring exercises, cutting and pasting, and the many other types of lessons which require these fine-muscle manipulations. In these, motor practice was a means to an end, not a lesson in and of itself. As soon as sufficient control had been established, manuscript writing provided the bulk of practice in motor skill, since that is the most directly useful exercise, the most easily diversified, and one readily coordinated with other lessons.

Spatial Relationships. Work in this area was directed at developing abilities in visualizing objects in two and three dimensions. The children began with assembling very simple, then more complex, form boards and progressed to paper and pencil tasks of spatial comparison requiring a choice as to which of several shapes would fit with another to form a complete figure. Standard puzzles also exercise this skill when solved with more dependence on form than on color or picture cues.

Cognitive Skills. The abilities just discussed may be regarded largely as facilitating the intake of information. In order to make use of this information, the child must also develop the cognitive skills necessary to recombining, transposing, and critically evaluating his store of experiences to find solutions for his daily problems. Training in the ability not only to notice and remember, but to think, to see relationships and to find solutions which go beyond the learned factual elements, was included in the curriculum. Direct training in the cognitive area has too often been omitted for the retarded on the grounds that abstract thought and generalization is difficult for such children.

It was for these very reasons that it was included in the experimental program; while abstract thinking is difficult, it is not impossible, and if an ability as vital as generalization is weak, then it is certainly deserving of training.

Progress at the beginning levels is difficult to assess. The program was, therefore, undertaken with the long-range view of building into the children the factors of critical evaluation and generalization necessary to subsequent success in reading comprehension, problem solving, and other cognitively demanding activities.

a. Logical Absurdities. To the retarded child who frequently fails to understand, absurdities become an accepted part of life. In order to break this passive acceptance of any statement by authority, the child must be taught to question. Logical absurdities were interspersed with true statements for the children to identify. Once the absurdity was located, the child either corrected it or explained why it was in error as a check against guessing or the correct answer arrived at for the wrong reasons. Absurdities were presented in two forms:

1. Pictorial absurdities. Pictures showing incongruous facts or actions were presented, as money growing on a tree, or a bear sitting in a parlor. The child identified and explained the absurdity.
2. Verbal absurdities. Incorrect statements, as "Mother sewed up the rip with her scissors," were interspersed with logical statements. The child identified and corrected the absurdity.

b. Unfinished Pictures. These required a similar skill. The child was to draw in the missing feature. Difficulty increased with the ambiguity of the outline of the pictures and the more detailed nature of the missing parts. As more is deleted from the picture, it becomes a test of the child's ability to recognize likeness from a reduced number of cues, which is another definition of transfer.

c. Pencil Mazes. Mazes were used to test not motor skill, but the ability to plan and use foresight. "Sidewalk" mazes with blind alleys were used rather than the more difficult and visually confusing labyrinth types. The children were instructed not to lift their pencils from the paper, although they could pause to plan as often as necessary. This left a clear record of deviations from the correct path.

d. Categories. The ability to categorize depends upon generalization, seeing the like elements of essentially unlike objects. It was first made certain that the children recognized each one of a group of pictures or objects. The simplest task involved sorting the members of the group into two set categories, as "things that go in the house" vs. "things that go in the barn." A more difficult lesson was to present the child with a group of pictures, asking him to find two or more categories into which they would all fit. Increasing the number of categories and including a few pictures that could not be combined with others both increased difficulty. These exercises served as a check on the adequacy of the child's concept, and as a measure of the ability to generalize and to shift the set from one property to another.

e. Sequences. Attention to sequence was included to encourage orderly thinking. This was done verbally, as in re-telling a story in logical fashion, or telling how to play a favorite game. For seatwork, pictures telling a story were presented in scrambled fashion for the child to organize. At the simpler level, the child listened to the story the pictures would tell before he attempted to re-tell it in pictures. Later he would be expected to construct an unknown story from its pictures, a task which required attention to detail, inference, and deductive reasoning.

Socialization. The establishment of socialization, a basic requirement for a learning climate, was given a high priority. Socialization requires direct teaching where an entire class is made up of immature children who lack experience with the customs and limitations of the classroom. Movement was from an initially relatively strict control to increasing permissiveness as the children became more able to govern their own behavior. Planned opportunities were provided for trying out new freedoms within clearly defined limits. To this same end, a social studies readiness program was developed which had as its core the child and his present social, physical, and psychological environment. Initial social studies units were developed by the teachers to provide a framework for developing the idea of the child as an individual, and the child as a member of a group. Additional units were taught to give the children the information necessary to help them live cooperatively in the school. One such unit is reproduced on the following pages.

Unit: Non-Teaching School Personnel

Objective 1: To know their function as school helpers; to cooperate

Motivation	Language Arts	Numbers	Performance
Visit the nurse for vision check.	Discussion Topics:	1. When does the custodian clean our room? How often?	Make scrapbook of helpers.
Visit cafeteria to see food preparation.	1. Non-teaching personnel a. Who works here besides teachers? b. Whom have you seen at work? c. How can you help?	2. What time do we eat lunch?	Draw pictures of trip to visit a school worker.
Show movie on school personnel.	2. Recognition a. Which wear uniforms? b. Can we learn their names?	3. What does a cafeteria lunch cost?	Make puppets for dramatic play.
		4. How many cooks, nurses, etc. are in our school?	Appoint junior custodian, etc. for the room to make helpers' work easier.
		5. Who must be at school early? Who stays late?	
	Dramatization: 1. Visit a helper, then dramatize his work.		
	Pre-reading: 1. Write a class story about the helpers.		

Objective 2: To know the helpers personally in case of emergency.

Motivation	Language Arts	Numbers	Performance
(Continued from Objective 1)	Discussion Topics:		
	1. Plan to visit or invite each helper; children practice making introductions.	On which floor(s) does each helper work?	Rehearse fire, other emergency drills.
		On what days (hours) is the nurse in the building?	Keep a record of times each worker helps the class.
	2. Discuss school routines for emergencies. a. Child hurt on playground. b. Milk spilled. c. Child loses way. d. Child becomes ill at school.		Map the building, showing where workers are to be found.
	3. Read and discuss stories on simple emergencies; how else could they be handled?		
	Dramatization:		
	1. Role-playing emergencies and how to get help.		

It, of course, remained necessary for much of the socialization to take place through direct experience of living with a group in the classroom and on the playground. The teachers tried to keep arbitrary rules to the minimum necessary to structure and clarify the situation, and to help the children learn through interaction the effect of their own actions on the responses of others.

The readiness program blended gradually into the primary program as the children individually became ready for more challenging work. None of the readiness areas discussed was ever terminated completely; constant growth in these areas is necessary for continued readiness for each successive phase of school work. In most cases, however, direct practice gave place to inclusion in the lessons of the various subject areas.

The Primary Program

The literature on the characteristics of the educable mentally retarded, both as children and as adults, emphasizes the consistency with which post-school problems are related to limited ability to cope with the complex, abstract factors that pervade our society. It is generally agreed that the school has a major contribution to make toward the adjustment of the young retardate at maturity in the form of providing the information relevant to problem solving and fostering appropriate behavior.

In considering the characteristics of the retarded as they relate to academic and social learning, it was felt that the limitations in spontaneous learning and in the ability to generalize counter-indicate any major emphasis on instruction by rote. This is held to be true despite the fact that rote teaching brings faster, more measurable results in certain areas, and greater uniformity of progress because of absolute teacher control. Instead, it was felt that in the special class teaching should be conceptual, based on understanding, yet without surrender of the role of the teacher as manager of the learning process. To this end an inductive method of teaching, usually called, through an over-simplification, the Discovery Method, was chosen for the special classes with the provision that non-conceptual learnings and those requiring an unrealistic expenditure of time for elicitation could be taught in rote fashion. For example, the inductive method was used in the teaching of addition, but the meaning of process symbols, such as the plus and minus signs, were taught by rote. The meaning of process symbols can be taught inductively, but considering the value to be derived, the investment in time and effort could better be applied to more profound and changing concepts.

Since a majority of the teachers were schooled in this method of instruction in the course of their preparation for teaching the educable mentally retarded, the inductive method pervaded the behavior of teachers and children in all pertinent areas of instruction and interaction.

The social and academic program of the special classes clearly followed the traditional school program in the organization of gross content areas. Inside this context, however, a relatively greater emphasis was given to the social significance of academic knowledge and processes. In this sense, the more technical aspects of reading and arithmetic were looked upon as means toward an end; they became tools in problem solving within the greater context of persisting life problems.

The teachers and supervisory staff used many procedures within the classroom to achieve their purpose. Not the least of these was grouping the children for instruction according to level and rate of learning. some areas of instruction the entire class formed the instructional unit, while in others the class was divided into groups according to such factors as ability, achievement, learning problems, or socialization. Formal and informal tests and observations were used as guides in grouping, which always remained fluid and subject to change. Individual instruction was given where indicated.

The Daily Schedule

The details of the daily schedule, and even the total hours, of necessity varied from district to district in which the classes were located. In every case the length of the experimental class day was the same as that of the regular classes in the same building, with no extra recess or play period. During the first year each of the experimental classes instituted a short rest period after the noon break, but none continued it into the second year as the children showed neither the need nor the desire for it. The four classes were housed under strikingly different conditions: an old, traditional school building; a former one-room school, remodeled and adjoining a larger school; and a modern building for the remaining two classes. All had cafeteria facilities, and the children had the option of remaining at school during the noon hour. Their teachers were free during the noon recess unless sharing lunchroom or playground duty, ordinarily their only free period of the day. While each teacher taught an essentially self-contained classroom, any special consultants available to the various buildings were also available to the special classes.

Each class began its day with opening exercises including the flag pledge, attendance check, review of the date and season, and morning news. Originally each day included an extended Show and Tell period with emphasis on practice in purposeful talking and listening. This was later shortened to allow only a few children to contribute each day in order to devote more time to the day's work. In the last years these statements were usually written in "Morning Newspaper" form for extra reading practice. After the first year the opening exercises were conducted largely by the children themselves.

Language arts and number work absorbed most of the remaining morning time. These being the areas most demanding of concentration, they were scheduled while energy was still high and the children rested and able to give maximal attention. Ordinarily twenty minutes to a half hour was spent in reading recitation for each group, while the other children studied spelling or had independent seatwork activities. Number work was usually taught at two levels, one group working with the teacher while the alternate group worked at their seats on related seatwork.

Music was commonly scheduled just before the noon break to counteract the heavy demands of the previous periods.

Afternoons were devoted to social studies unit work, including science and health, and to the cognitive skill areas or additional practice in language arts. Arts and crafts were scheduled more often during the first year, but rarely more than twice a week except for pre-holiday periods as the children grew more able to profit from more academic work.

The Curriculum. The curriculum of the primary program included activities in social studies, language development, reading, spelling, arithmetic, and the nonacademic areas of music, arts and crafts, and physical education. Health and science were made an integral part of the social studies program.

Social Studies. The social studies program was organized around the concept of the educable mentally retarded child in an environment that expands socially, psychologically, and physically as he matures. Since the initial phase of the program was organized to arouse in the child an awareness of himself within a social context, first emphasis was on self-appraisal as well as knowledge of the people and things immediately surrounding him. Units of study were planned to help him realize his values, his likes and dislikes, and his attitudes about the people, events, and objects that make up his world.

Subsequent work emphasized the child's wider interactions with people in their various social roles, and with the physical factors near him. The expanding scope of subsequent units included the family, neighborhood, and community.

A typical social studies unit included information on the social roles of its key persons, the physical objects or environment associated with the subject, and the interrelationships between the child and the area of study. For example, in studying the fireman as a community helper, the class would learn what his work is and that he wears a distinctive uniform which aids recognition. They would also become acquainted with his equipment and its use, with the fire engines and firehouse, how fire burns, how fires may occur, and fire prevention measures. Finally they would look at the way in which the fireman's work directly and indirectly affected their lives, their own responsibilities in the area of fire prevention, and their attitudes toward the fireman as a member of an interdependent society. This final area of recognition of the interrelatedness of the life of the pupil with the lives of those he studies was emphasized in each unit.

In planning the lessons through which the unit work was taught, the teachers tried to achieve a balance between observation (such as demonstrations or field trips), action (as experimentation and construction projects), and study (as reading assignments, discussions, and tests). Action which directly involves the children seemed best calculated to demonstrate to them the need for the particular learning, to impress facts upon their memories, and to encourage transfer. This followed the philosophy of discovery rather than expository teaching, and the curriculum's commitment to fostering meaningfulness in learning.

Health and science were incorporated directly into many of the units, while the unit themes were reflected in as many of the subject areas as feasible, to foster transfer. To aid the teachers, some units were made up as tape lessons for the children to listen to, coordinated with suggested teacher-led activities. A portion of such a taped unit on weather is presented here.

Portion of Taped Unit on "Weather"

Clouds

Materials

Saucer filled with water; piece of cloth

NOTE: This should be started in the morning.

Teacher Discussion

1. Display three or four pictures where clouds are predominant. Discuss pictures, drawing attention to the clouds. Have children tell of different kinds of clouds they have seen.

2. Wet a piece of cloth. Have children examine it. Have someone put it near the heat. See if any of the children can predict what will happen to the cloth.

3. After lunch examine the cloth. Elicit from the children the fact that it is dry--the water is gone. Compare this to mother drying clothes on the line.

Tell the children they will now hear a tape story that will tell them where the water went.

Clouds (Taped)

Hello, Boys and Girls. Today we are going to find out what happened to the water in that piece of cloth.

Remember what your teacher did to the piece of cloth? That's right, he put water on it, and then it was put somewhere in your room to dry. The cloth did get dry, didn't it?

We had better find out where that water went. It may sound funny to you, but the water went somewhere where you can't see it. It went into the air. That's right, into the air in your room.

When water goes into the air we say the water evaporated. Let's all say "evaporated." E-VAP-O-RAT-ED.

When your mother hangs wet clothes out on the line, what happens to them? Right, they get dry. Now we know that the water in those clothes went into the air. It evaporated.

The water out of clothes isn't the only water that evaporates into the air. The water from puddles, from wet streets and sidewalks, and even from your car after you wash it, evaporates. It all goes into the air.

Now, something must happen to all that water that goes into the air. Do you remember the pictures of the clouds that the teacher showed you? When all the water goes into the air, it makes these clouds. When the clouds get full of water, so full they can't hold any more, what do you think happens? That's right, it rains.

Sometimes we see pretty white clouds in the sky and it doesn't rain. Those clouds have only a little water in them. But in a few days if more water evaporates and goes into those clouds, then it will rain.

There is another kind of cloud that stays very close to the ground. Sometimes this cloud makes it very hard for us to see outside, and we have to drive our cars very slowly. Do you know what we call this kind of cloud down on the ground? That's right, we call it fog.

Don't forget now. The water goes into the air--it evaporates. And when water evaporates, it makes clouds.

Follow-Up

1. What happens to water when it leaves the wet clothes, puddles, etc.?
2. What word did you learn that means the water went into the air?
3. When all the water evaporates into the air, what does it make?
4. When the clouds get full of water what will happen?
5. Does it always rain when we see clouds in the sky?
6. What kind of cloud stays right around the ground and makes it hard for us to see?

Follow-Up Experiment

Put some water in the saucer. Tell children you will leave it there for two days and then look at it. Elicit from children what should happen. Check in two days and again elicit what has happened to the water.

Some published materials were used to supplement the teachers' planning. The Golden Rule Series (Leavell, Friebele, & Cushman, 1957), published by the American Book Company, provided stories of moral conflict or problems of interpersonal relationships in everyday circumstances. These were a useful basis for class discussions of the less tangible learnings on tolerance, sportsmanship, or the importance of certain traits of character. The stories were taped for listening or read aloud by the teacher, as the children's social age outstripped their reading achievement. During the final two years of the project portions of the Tiegs-Adams Social Studies Series, revised edition (Tiegs & Adams, 1960), from Ginn and Company were used. Large amounts of supplementary material were, of course, necessary, but portions of the books were appropriate and having a hard-cover book stimulated the children's interest.

Reading. The experience approach (sometimes called the chart method) was used to introduce reading. When introduced through a basal reader series, reading is seen as a subject to be taught in school, and a minimal sight vocabulary is taught first. The experience method regards reading as an extension of the child's earlier language experiences, and stresses first the realization that reading communicates ideas, before even a rudimentary sight vocabulary is attempted. The experience method, which teaches reading from chart stories made up by the children about their own experiences and in their own words, appears to have definite advantages for the retarded. Among these is the fact that meaning takes precedence over sight vocabulary, which these children too often learn by rote. The vocabulary is necessarily that of the children, as they dictate the stories, while the vocabulary of the basal reader is geared to the average child presumed to have shared average experiences. The same may be said of the interest value of the stories; children are always interested in stories about themselves, while the familiar "middle-class bias" of the readers is in conflict with the home experiences of many among the retarded.

In producing a reading chart, an experience shared by the class was reviewed in a brief discussion (two to three minutes) in which the teacher made certain the points he wished on the chart were refreshed in the children's minds. The class then dictated the story, a sentence at a time, for the teacher to write on a chart. The children's wording was strictly preserved. Incomplete or unacceptable sentences were discussed with the class, the teacher always returning to the child who had originally volunteered, asking him to state the sentence as he now wished it. Each sentence was read aloud by the teacher as soon as it was written, while still clear in the children's minds.

Beyond this procedure, the usual standards governed the charts; no more than four lines initially, one sentence to a line, and where possible a phrase repeated in two adjoining lines for easy visual comparison. The completed chart was then transferred to tagboard in the teacher's most standard manuscript writing.

The chart was first committed to memory, as the children learned that the written words repeated just what they themselves had said. Next they learned to differentiate sentences, then words, learning what part of the story each told. Finally, the child learned to rebuild the chart from its separate words and to understand the meaning of what he had produced. The chart was then retired for use in review, and new chart stories were made up. For those interested in the method, detailed instructions on how the charts were taught and an extended rationale for their use has been published (Jordan, 1963).

Cooperative stories made by the children were used as an intermediary between the chart stories and the standard readers eventually adopted. For the cooperative stories each child illustrated a different portion of a shared experience, then dictated a sentence describing his picture. Each picture, with its descriptive sentence written below it, formed one page of a booklet about the event which could be read and re-read, using context clues from the pictures.

Once the expectation of meaning had been firmly established, and some sight vocabulary built, a basal reader series was introduced.

Longer and more elaborate chart stories were continued meanwhile to provide supplementary practice and for special projects. The McKee Reading Series, , revised edition (McKee, 1957), published by the Houghton Mifflin Company, was adopted.

The reading program as a whole had two major goals: (1) to develop the technical skills of quick recognition and word attack, and (2) to foster comprehension. To aid in developing comprehension, the teachers in the experimental classes followed a pattern of story analysis wherever the text provided the opportunity. The sequence was as follows:

1. Labelling. The children were asked to name objects, places, and people in the story.
2. Detailing. They were then asked to describe important characters, objects, and events.
3. Inferring. The children were asked to account for the occurrence of certain events, or to tell what specific people might be doing on the basis of clues available in the story or from its pictures.
4. Predicting. At appropriate stages in the reading, the children were encouraged to predict trends and events in the story. These were later verified or corrected and the important clues reviewed and associated with the results.
5. Generalizing. During the discussion period in which the story was reviewed and summarized the teacher attempted to have the children relate issues in the story to their own behavior or values, and to derive valid generalizations.

Obviously, not all reading assignments lent themselves to the application of all five stages of analysis, and some, typical of the early stages of reading, did not permit much more than the first two. The decision as to how far and how intensively to pursue this phase of the reading program was an outcome of discussion among the experimental class teachers and the supervisory staff.

The program of word recognition focused primarily on the use of context cues (again to emphasize the expectation of meaning) and phonics. The phonic method was that described for use with the retarded by Kirk (1940).

As reading skills and comprehension increased, they were combined with other areas of learning to augment the teaching procedures and aids being used. Wherever possible, these skills were used as a technique in problem solving.

Spelling. Spelling was initiated when the children had a sight vocabulary of at least 50 words and had developed enough skill in manuscript writing so that the motor component did not absorb too much attention. It was considered essential that the children be able first to read the words they were to spell. Words were chosen from their chart stories and readers, from the Dolch list of the 220 words most commonly used (Dolch, 1949), and from words needed and used by the children in other lesson areas. Color and number names, easily illustrated and useful in beginning seatwork, were included. "Picture dictionaries" were sometimes made; charts illustrating nouns and verbs were hung in view for easy reference if words were forgotten.

Activities were chosen primarily to focus attention on the whole word and its meaning rather than letter games which call attention to the parts of the word. Only in the final years, when both spelling and phonic skills were better developed, were the children encouraged to use phonics to help them analyze the words they spelled.

Some of the practice activities used were blackboard games of reading the words, fitting the words into sentences made by the teacher, making up sentences using the words, and writing the words for practice. When the children made up original sentences they were held responsible for the correct spelling of only their study words. As long as the meaning was clear, other spelling errors went unmarked in these exercises to encourage freer expression and to avoid the tortured constructions or arid sentences meant to avoid difficult words.

It was found more economical of learning time to assign a relatively large number of words and to make review words from previous lessons a part of each week's list. This procedure provided distributed rather than massed practice.

Arithmetic. Initially, the children in the experimental classes were able to count by rote to a limited extent only; the first phase of the formal arithmetic program was to expand rote counting ability, learning the sequence of numbers. Once the children had a workable repertoire of number labels, each number concept and its verbal label were tied together through rational counting. Rational counting and all subsequent phases of arithmetic computation were placed, wherever possible, in a problem-solving setting. To this end quantitative learning was not restricted to the formal arithmetic period but was used wherever feasible through the school day.

For beginning instruction in rational counting, the children used three-dimensional, manipulatable objects with which numbers and their properties could be illustrated. Many types of objects were used, to enhance generalization.

As the children expanded their concept of number, instruction included the matching of quantities of objects with the appropriate number symbol and number word. As reinforcing exercises, the children would write the symbol or the number name describing a quantity of objects, or given the symbol or name would show the appropriate quantity. It was at this time that the first step in the learning of place value was introduced to continue as a parallel to instruction in computation and problem solving.

Addition and subtraction were introduced through practice in grouping, an activity which had as its goal rapid and accurate identification of discrete quantities of objects without counting. This was emphasized in order that elements in later calculations might maintain their group properties; addition being the combination of groups, the objects to be added should be perceived as groups. Reducing them to units for counting both obscures the process and introduces another possibility of error. Grouping was taught primarily through three-dimensional objects, as the arithmetical processes would also be introduced through objects, not pictures or number symbols.

As the children gained skill in recognizing numbers as representing groups of objects, the beginning stages of formal computation developed. Addition and subtraction each started with the appropriate combining or dividing of groups of objects and advanced through a similar progression to purely symbolic representation. This progression can be illustrated through a description of the process by which addition was introduced.

1. The teacher first demonstrated the combination of groups, using three-dimensional objects and asking the children to verbalize what they saw, as, "You took two blue blocks and one red block and put them together."

2. The second step combined this verbalization of what was done with finding the size of the new group. "You put two red blocks with three blue blocks and got five blocks."

3. Flannel-board cut-outs of various forms, two-dimensional but readily moveable, were used to illustrate and solve the problems.

4. Number symbols were next placed beneath each pictured group, and from these and the proper process symbol the horizontal algorism was derived.

Only when the children had demonstrated comprehension through developing the algorism from action involved in manipulating groups of objects, and the reverse procedure of illustrating an algorism through action, were they given drill to reinforce their learning. This procedure was followed throughout the instruction in simple addition and subtraction and the more complex "carrying" and "borrowing" processes. For those children who, by the end of the study, were ready to learn multiplication and division, the processes were again introduced conceptually, to be followed by supervised practice.

Special attention was given to the vocabulary of arithmetic. There is an obvious vocabulary of liquid, dry, and linear measures and of time, money, and similar systems. In addition to stressing these terms, the teachers placed particular emphasis on the many terms that may indicate process in story problems, prepositions, the comparison of adjectives, and such abstract, changeable quantitative words as _more_, _less_, _some_, _few_, or _many_. Such measurement words and concepts as _big_ and _little_, or _wide_ and _narrow_, and the problems of real and relative size, weight, age, etc., were explicitly included in the curriculum.

All concepts were presented in a spiralling form, with only the major ideas and usage at first. With each succeeding year the children studied these same areas (simultaneously adding new tapes), widening and deepening the concepts and the understanding of applicability. Extra effort was made to relate all of the arithmetic learning to a useful place in the children's lives.

Nonacademic Activities. Music, physical education, and arts and crafts were taught by the experimental class teachers with assistance from specialists in these areas when such assistance was available. All three areas received most emphasis during the first year when they were necessary to break up the longer, demanding periods of concentration, to provide a change of pace to children not accustomed to sitting still, and to provide a different kind of success experience. Music and art were included primarily for self-expression and leisure-time enjoyment. As the children's attention span increased, these areas received only slightly more time during the week than they are customarily given in regular grades for children of the same age.

Qualification of the Teachers

Other than the biases of the project director, there were no meaningful criteria underlying the selection of teachers. It was felt that more constructive teacher contributions to the study would result from the employment of teachers whose preparation to teach EMR children was recent and intensive. Since it was part of the total plan to give the teachers close and constructive supervision, the element of experience did not assume its usual degree of importance.

The four teachers of the first year all held the Bachelor's degree in the education of the educable mentally retarded. For two teachers, this was the first experience in teaching a special class. The others had each completed two years of teaching retarded children. Three of the four had received their preparation at the University of Illinois under one of the project directors. This was considered desirable because it meant that they shared a common frame of reference in special education for the retarded. The fourth teacher was a graduate of Southern Illinois University, and required little re-orientation. Much of this re-orientation was accomplished during the summer working session in preparation for the first year of instruction.

In the course of the four years of the study, a total of ten teachers, seven females and three males, each with certification in mental retardation, taught in the special classes, with no one teacher teaching in one class for more than two years. The turnover was due to the traditional factors of marriage, pregnancy, and family mobility.

To counteract the wide geographic separation between classes and the possibility that lack of communication might lead to diversions from the central theme of the educational program, the teachers were called together, usually at six-week intervals, to exchange experiences and plans. Also, the teachers devoted four to eight weeks of each summer in working together, evaluating the previous year's accomplishments, and preparing materials for the coming year.

Supervision

As stated earlier, the extent and nature of supervision was considered to be a crucial aspect of the study. It was felt that teachers of the retarded, because of their limited opportunities for professional interaction with their colleagues, need interested, objective help in maintaining their perspective and in keeping up to date in matters important to their function. To provide this, a full-time special class supervisor was included in the project.

The supervisor provided much of the leadership in planning and implementing the educational program. In this capacity, the supervisor visited each experimental class frequently in order to assist the teachers in sustaining the program in their classes and to interpret the program to the school administrators and faculty.

While not in the classroom, the supervisor helped to locate and develop teaching materials and aids for the experimental classes and provide guidance in their application and evaluation. She acted as liaison person with the other members of the project staff and provided guidance in the selection and administration of measurement devices and techniques. The supervisor also made up the agenda for the teachers' meetings and was active in policy and decision making.

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APPENDIX B

Family Background of Educable Mentally Retarded Children[1]

Much has been written about effects of cultural deprivation upon intellectual functioning (Hunt, 1961; Masland, Sarason, & Gladwin, 1958; Kirk, 1958; and Riessman, 1962). Cultural deprivation implies an inaccessability to the vocabulary (Bernstein, 1961), the values and motivation (Schneider & Lysgaard, 1953), conceptual apparatus (Inhelder & Piaget, 1958), and ways of acting (Miller & Riessman, 1961) which are required for successful participation in the major institutions of the society, such as school, government, and economic enterprise. This culture is sometimes designated as middle-class culture, the formal culture, the public culture, or the culture transmitted in the schools. Regardless of the name applied, there is a general consensus that when access to this culture is impeded, intellectual development is somehow stultified. The investigation of family backgrounds of the educable mentally retarded children in the study was undertaken to determine the presence of factors which appear to be related to the phenomenon of cultural deprivation. Since previous investigations have indicated that cultural deprivation is associated with socioeconomic level, the investigation was designed to study influences other than socioeconomic factors in mental retardation.

The following characteristics of family life were investigated:

1. Integration of the family in the community. If children are to have access to the content of the dominant culture, the parents should be

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[1] Data collection by Joseph H. Meyerowitz while a member of the project staff.

integrated into the formal and informal groups which reflect this culture. Community relationships which appear to reflect integration into the community of the families of the retarded were studied. These community relationships included (a) participation in formal organizations, such as voluntary associations and religious institutions, and (b) informal relationships, such as contact with neighbors and friends. In addition, residential mobility of the family was investigated.

2. Resources in the home. Ordinarily, the family is expected to provide children with an introduction to the content of the dominant culture. Accordingly, personal, cultural, and economic resources of the families to provide this cultural content were studied. These resources included education of the parents, income, dependence upon welfare agencies, health of the mother, presence of a telephone, and exposure to mass communications, such as movies, magazines, and newspapers.

3. Family relationships. Studies of maternal deprivation have suggested that warm, stable relationships in the family are conducive to the child's personal development (Hunt, 1961; Casler, 1961). Various factors which may affect the stability of relationship between parents and their children were studied. These factors included extent of divorce and remarriage, birth of the retarded child outside the present marriage, age of the parents, birth order of the retarded child, and degree of crowding in the home.

4. Motivation by parents. Finally, those parent-child relationships which are relevant to the motivation of the child in school were investigated. These were (a) the parents' aspirations with regard to the child's ultimate educational attainment, and (b) the extent to which parents experience difficulty in handling the child.

The majority of the 120 educable mentally retarded children in the study came from homes in which there was a low income and in which the parents were engaged in unskilled, or semiskilled occupations. Integration of the family in the community, resources in the home, stability of family relationships, and parental motivation are all associated with socioeconomic variables. A comparison between families of the retarded children with families in a representative sample from the community would therefore not reveal those factors which are themselves related to mental retardation. However, many families with socioeconomic characteristics like those of the retarded children do not produce retarded children. Hence, in the investigation a sample of 60 families of comparable income and occupational status with normal children was selected for comparison with the families with retarded children. The person interviewed was the mother or her surrogate (usually the grandmother).

The comparison group of families with normal children was selected from the same areas in which the families with retarded children resided. The normal children were in the same schools as the retarded children. The distribution by income and occupation of families in both groups is presented in Table B-1.

Table B-1 indicates that the weekly income of the families of the retarded group was approximately the same as that of the families of the normal group. However, while proportions in semiskilled and unskilled occupations were similar for the two groups, the proportions in the professional and skilled worker categories were not. The professional and managerial category had approximately 10 percent more fathers from the normal group than from the retarded group. On the other hand, the skilled

Table B-1

Weekly Income and Father's Occupation in Families with Retarded Child and in Comparison Group Families with Normal Children

Income and Occupation	Retarded	Normal
Weekly Family Income		
less than $35	21.5%	21.3%
$36 to $85	70.0	66.0
more than $85	8.5	12.7
Father's Occupation		
Professional, Managerial	11.2	21.8
Skilled	19.6	10.9
Semiskilled	24.3	29.1
Unskilled	44.9	38.2

category had about 10 percent more fathers from the retarded group. With these exceptions, socioeconomic characteristics of the two groups were comparable.

Integration of the Family in the Community

One of the tasks in family life is to socialize children so that they can develop into mature, responsible adults. To do so, however, the family must be sophisticated about adult society. Moreover, since modern society is very complex and changing, a family must participate constantly in the institutions of the society to perform its socialization task adequately. Deutsch (1960) and others (e.g., Fraser, 1959), have indicated that family isolation from major institutions in the society affects scholastic achievement. This isolation may also affect the intellectual functioning of children. This section describes findings on formal and informal community participation of the parents of the educable mentally retarded children.

Formal Organizations

The participation of the parents of the retarded children in two kinds of formal organization were investigated. These were membership in voluntary associations and religious organizations.

Voluntary associations are those formally organized groups, such as clubs, unions, athletic teams, and other organizations which ordinarily have a definite charter or by-laws, a definite membership, and a set of officers. The findings pertaining to membership in voluntary associations are presented in Table B-.2. About half of the parents of the retarded children, as compared with less than one-fourth of the parents of the normal children, did not belong to any voluntary associations. Moreover, almost one-third of the parents of normal children, but very few parents of the retarded, belonged to three or more voluntary associations. Table B-2 clearly indicates that there is a greater tendency of parents of normal children than parents of retarded children to belong to voluntary associations.

Table B-2

Number of Voluntary Associations to Which Parents Belong

Number of Associations	Retarded	Normal
0	49.2%	22.4%
1-2	44.1	44.8
3+	6.7	32.8

The data on participation in religious institutions were analyzed in terms of denomination and church attendance. The findings are presented in Table B-3. The results on membership in religious denominations indicate a tendency for the parents of normal children to belong to the traditional denominations, such as Catholic or Protestant groups, to a greater extent than parents of the retarded. More parents of the retarded were classified in the residual category of religious organizations. The residual category consists mainly of small sects. These religious sects may represent small, unstable groups which are isolated from the major religious traditions of the society. Their isolation from these traditions

Table B-3

Religious Affiliation and Church Attendance of the Parents

Religious Characteristics	Retarded	Normal
Religious Denomination		
Protestant	67%	79%
Catholic	7%	14%
Jewish	0%	0%
Others	26%	7%
Church Attendance		
Attended at least once per month	51%	85%
less than once per month	21%	5%
did not attend	28%	10%

prevents the integration of individuals into those institutions which reflect the dominant culture of the society (Yinger, 1957; Lipset, 1960).

The second analysis on religion concerned church attendance. Although 85 percent of the parents of the normal children reported that they attended church services at least once a month, only 50 percent of the parents of the retarded did so. Over one-fourth of the parents of the retarded did not attent church at all, while only one-tenth of the parents of the normal children were non-attenders.

In summary, the data on religion revealed that the parents of the normal children were more often members of the major denominations in the society, while the parents of the retarded children were more often members of deviant religious sects. In addition, the parents of the normal children reported more often that they attended church regularly. Together with the findings on membership in voluntary associations, in the two groups the data on religion indicate a greater tendency of the parents of normal children to participate in formal organizations in the community.

Informal Community Activities

The extent to which the parents of the mentally retarded children participated in informal activities in the community was indicated by their interaction with friends and with neighbors. Interaction with friends was indicated by (a) the extent to which visits are exchanged, and (b) amount of recreational activities with friends. Interaction with neighbors was determined by the parent's response to a scale of neighborliness developed by Wallin (1953).

The extent to which visits were exchanged with friends is shown in Table B-4. Parents of the retarded reported less exchange of visits than did parents of the normal. Although only 3 percent of the parents of the normal children reported that they never exchanged visits with friends, 14 percent of the parents of the retarded did so. Whereas 47 percent of the parents of normal children reported that they often exchanged visits, only 30 percent of the retarded gave this response.

Table B-4

Exchange of Visits with Friends

Response	Retarded	Normal
Never	14.4%	3.4%
Sometimes	55.9	50.0
Often	29.7	46.6

Findings on attendance at recreational activities with friends were similar to those on exchange of visits. The findings on recreational activities are presented in Table B-5. Fourteen percent of the parents of the retarded but only 3 percent of the parents of the normal responded "never." Twenty percent of the parents of the retarded and 35 percent of the parents of the normal responded "often." Thus, the findings on interaction with friends clearly indicate that parents of the normal children interacted to a greater extent with friends than did parents of the retarded children.

Table B-5

Attendance by Parents at Recreational Activities with Friends

Response	Retarded	Normal
Never	14.4%	3.4%
Sometimes	40.7	44.8
Often	19.5	34.5

The findings on neighborliness are presented in Table B-6. Over one-fourth of the parents of the retarded scored low on neighborliness whereas less than one-fifth of parents of the normal were low. On the other hand, only one-fourth of the parents of the retarded were high in neighborliness but almost half of the parents of the normal children were high. The results relating to neighborliness and friendships indicate that generally the parents of the normal children participate more in informal community activities than do parents of mentally retarded children.

Table B-6

Extent of Neighborliness of Parents[a]

Neighborliness	Retarded	Normal
Low	29.5%	17.3%
Moderate	45.6	35.7
High	24.9	47.0

[a] See Wallin, P. A Guttman scale for measuring women's neighborliness. Amer. J. Sociol., 1953, 59, 243-246.

Mobility

The findings on residential mobility suggest that the lesser community integration of the parents of the mentally retarded children as compared to the parents of the normal children is occasioned in part by high residential mobility. In both groups, about 60 percent of the families were descended from grandparents born in Illinois. Approximately 37 percent of the mothers and 27 percent of the fathers were born within the area in which they were living at the time of the interview. Over half of the grandparents were sufficiently close by to be visited at least once a month. In spite of the general stability of the families within the area of the study, however, there was more residential mobility on the part of the parents of the retarded. Thirty-five percent of the families of the retarded, as compared with 14 percent of those with normal children, had lived at their current address for less than a year. [For the U.S., about 20 percent of the population move each year (U.S. Statistical Abstracts, 1963)]. Presumably families with educable mentally retarded children who had not moved in the previous year were also relatively more mobile than the parents whose children are of normal intelligence. Residential mobility, like low participation in formal and informal community activities, suggests a lack of integration of many families with retarded children into the major community institutions.

Family Resources

If a child is to be socialized to become a responsible adult in society, the family must have various personal, cultural, and economic resources to provide him with the intellectual tools that he will need. Educated, healthy parents with a high income generally provide their children with the means for learning the intellectual and social behavior associated with the dominant culture of the society. Conversely, the absence of these resources would interfere with the socialization of the child. Accordingly, those family resources which were studied included education of the parents, income per family member, dependence upon welfare agencies, health of the mother, and mass communication media available.

Education of Parents

Table B-7 shows the last grade in school completed by the mothers and fathers of both retarded and of normal children. About two-thirds of the mothers of normal children had finished at least 10 grades in school. In contrast, the majority of the mothers of retarded children

Table B-7

Parents' Education: Last Grade Completed

	Mothers		Fathers	
Grade	Retarded	Normal	Retarded	Normal
6th or less	7.7%	3.4%	18.6%	8.6%
7-9	50.8	31.0	49.2	37.9
10-12	38.1	60.3	29.7	50.0
College	3.4	5.3	2.5	3.5

had completed nine grades or less. For the fathers, the results were similar. Over two-thirds of the fathers in the retarded group completed nine grades or less as compared with almost half the fathers in the normal group. There was clearly a tendency for parents of normal children to have completed more years of school than parents of the retarded.

Income per Family Member

Table B-8 shows the amount of income per week per family member. Although total family income for the families with a mentally retarded child and for the families with a normal child showed little difference, the two groups did differ on income per person. For the normal group, 31 percent of the families had a weekly income of 25 dollars or more per person, whereas in the retarded group only about 15 percent had an income of 25 dollars or more. Moreover, over 40 percent of the retarded group, as compared with about 30 percent of the normal group, had an income of less than 12 dollars per week per person. These findings indicate that families with a retarded child had fewer financial resources for each child.

Table B-8

Income Per Person in Family Per Week

Income	Retarded	Normal
- $12	43.2%	32.8%
$13 to $24	42.4	36.2
$25 +	14.4	31.0

Dependence upon Welfare Agencies

Although the common stereotype of families with mentally retarded children is one of a "problem family" constantly on welfare roles, an examination of the files of county and social agencies revealed that few of the families within the study were known to these agencies. The most frequent bases for aid were unemployment insurance, workmen's compensation, and old age assistance as opposed to ordinary relief payments. However, especially in Kankakee, most families without a husband-father were on ADC rolls. More families with a retarded child than with a normal child appeared on welfare records.

Health of Mother

The health of the mother can be regarded as a resource in the socialization of the child. The mother who regards herself as being in poor health can ordinarily not be expected to put forth the amount of effort needed to provide children with the means for facilitating their socialization. In fact, past evidence suggests that mothers who regard themselves as being in ill health use this personal condition to avoid responsibilities (Farber, 1960). Table 8-9 presents findings related to the health of the mother. The mothers were asked:

1. Are you in good health?
2. Since __________ was born, have you been bothered by any special conditions or problems?
3. If yes to 2., have you sought any kind of help?

Fifteen percent of the mothers of retarded children as compared with eight percent of the mothers of normal children responded that they

Table B-9

Reported Health of the Mother

Response		Retarded	Normal
1. Good health?			
	No	15%	8%
2. Bothered by special condition?			
	Yes	20	20
3. Sought help?			
	Yes	18.5	9
	No	6	14

were not in good health. Although the percentage of mothers who responded that they were bothered by a special condition in both groups was the same (20 percent), almost all of the mothers of retarded children sought assistance to remedy their condition. However, less than half of the mothers with a special condition in the normal group sought assistance. This finding suggests various interpretations: (a) mothers of the retarded children are less self-reliant, (b) they seek confirmation by outsiders that they are not in good health, or (c) they have more serious health problems.

All of the findings relating to personal, economic, and social resources of parents indicate that the parents of the retarded children have fewer resources for effective socialization than do parents of normal children.

Mass Communication Media

Three questions were asked to elicit information on the extent of family contact with mass communication media. These media can be a source of knowledge about society even when individuals are generally isolated. The questions asked were: (1) How often do you go to the movies; (2) Do you subscribe to or purchase any newspaper or magazine; and (3) Do you have a telephone. Because many of the respondents lived in rural areas far from television stations, they were not asked about television watching.

The findings on exposure to mass communications media are presented in Table B-10. Forty-four percent of the families with retarded children as compared with 28 percent with normal children never go to movies. Over half of the families of the normal but a little under half of the families of the retarded go occasionally. A small percentage (15 percent) in both groups goes at least once a month. The families in the normal sample thus were exposed to a somewhat greater extent to the content of American culture as shown in movies. The results were similar for magazine and

Table B-10

Exposure to Mass Communication Media

Communication Media	Retarded	Normal
Go to movies once per month	15%	15%
Go to movies less than once per month but at least on "holidays"	41	57
Never go	44	28
No magazine or newspaper enters home on regular basis	21	12
No telephone in home	33	22

newspaper purchasing. About 20 percent of the families with a retarded child do not receive a magazine or newspaper on a regular basis; only a little over 10 percent of the families with a normal child are not exposed to a magazine or newspaper regularly. The findings on a telephone in the home are in the same direction. A third of the families with a retarded child do not have a telephone in the home, while about one-fifth with a normal child are without a telephone.

In general, the findings indicate a lesser exposure to mass communication media by the families with a retarded child. Since the movies, magazines, newspapers, and telephones all involve a money expediture, the smaller amount of money available per person in the families of the retarded probably affects their exposure to mass communications media. The lower educational level of the parents of mentally retarded children is probably a factor in their lesser inclination to read magazines and newspapers regularly. Moreover, if the families with retarded children participate less with friends and neighbors, they have less need for a telephone. The lower exposure of families with a retarded child to mass communications media would serve to further isolate them from the major institutions in the community.

Family Relationships

The ideal family life in the United States is one characterized by stability, companionship, and lack of friction. Ideal parents are those who shower affection and attention on their children but at the same time promote the development of children as independent beings. This section describes characteristics of the parents and of the household as they may affect family relationships.

Parents

Information concerning the parents included responses to questions on marriage and age of the parents. The findings are presented in Table B-11. The material on marriage in Table B-11 indicates that, on the average, families with a retarded child had been married slightly longer than families with normal children. However, one-fifth of the marriages in the retarded group were of a duration less than the age of the child. In contrast, only one-twentieth (5 percent) of the marriages in the normal group were of such short duration. Thus, 20 percent of the retarded children have known a parent other than their current set of parents. Most important to note with regard to stability is that parents in families with a retarded child showed a greater tendency to have been remarried (presumably divorce and remarriage) than parents with normal children. Hence, there is less stability indicated in families which have a retarded child.

Further indication of unstable family relationships is suggested by data on age of parents in Table B-11. Although the mothers of the retarded children were generally younger than mothers of the normal children, the reverse was true for the fathers. Twenty-five percent of the mothers of retarded children were aged 25 or less, whereas only 13 percent of the mothers of normal children were in that age range. However, 21 percent of the fathers of the retarded children were over 45 whereas only 8 percent of the fathers of the normal children were so classified. This finding suggests that there is a greater age spread between the husband and wife in families with a retarded child than in families with a normal child. The long term trend in the United States

Table B-11

Marital Status and Age of Parents

Marital Status and Age	Retarded	Normal
Marital Status		
Unmarried at time of interview (mothers)	15.0	15.0
Married other than to first husband	20.0	20.0
Married fewer years than age of child (6.5 yrs.)	20.0	5.0
Married up to 10 years	18.0	18.0
Married 11 - 16 years	33.0	52.0
Married more than 16 years	14.0	9.0
Families with mother or either spouse remarried	32.0	24.0
Fathers remarried	22.0	11.0
Age of Parents		
Age of mother		
25 years or less	25.0	13.0
26 to 35	63.0	64.0
36 to 40	12.0	23.0
Age of father		
25 years or less	15.0	5.0
26 to 40	53.0	61.0
41 to 45	11.0	26.0
46 or over	21.0	8.0

toward marriages in which the husband and wife are similar in age has been accompanied by a continual increase in equalitarian, companionate relationships in marriage (Burgess, Locke, and Thomes, 1963). When the husband is considerably older than the wife, an authoritarian relationship will more likely be established. An authoritarian marital relationship will probably affect the personal development of children (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950). In addition, since one-fourth of the mothers in the retarded group were still under 25 at the time of the study, they were teenagers when the child was born and may have been ill-prepared as teenagers to cope with the raising of children. Considered together, the findings on marriage and age of parents suggest that the families with a retarded child are less stable and that the relationship between the parents is apparently less equalitarian and less companionate.

Household

The second group of family characteristics studied were attributes related to the amount of attention and affectionate behavior which the parents can provide for each of their children. Table B-12 indicates a lack of privacy in homes of families of the retarded. Thirty-six percent

Table B-12

Number of Rooms in Dwelling Unit

Number of Rooms	Retarded	Normal
4 or less	36%	21%
5	24	39
6 or more	40	40

of these families, as compared with 21 percent of families with normal children, lived in dwelling units with 4 or less rooms. However, as shown in Table B-13, regardless of the number of rooms in the house, homes of families with mentally retarded children were more densely populated than homes of families with normal children. Even when there were 8 or more rooms in the dwelling unit, the density in the retarded group was over twice that in the normal group. In the households studied, residents included not only members of the nuclear family (husband, wife, and children), but also boarders, more distantly related children, and other relatives. Under these conditions, noise and lack of privacy would interfere with the attentive behavior desired in parent-child interaction.

Family relationships appear to be complicated further by the birth order of the children. Table B-14 presents information on birth order. Half of the retarded children were middle-children rather than the eldest or youngest child. By comparison, only slightly over a third of the normal children were middle-children. In a large family, the youngest child is usually the recipient of more attention and affectionate behavior than other children (Bossard & Boll, 1956). It is therefore significant that 40 percent of the normal children as compared with 20 percent of the retarded children were the youngest in the family. The lack of attention given to the retarded children is further suggested by information on the number of siblings who are younger than the retarded child. Almost 50 percent of the retarded children had 2 or more younger

Table B-13

People Living in Dwelling Unit

Number Rooms in Dwelling	Average Number People Per Dwelling		Persons Per Room	
	Retarded	Normal	Retarded	Normal
2	5.5		2.75	
3	6.1	4.5	2.04	1.50
4	6.1	4.9	1.52	1.22
5	6.7	5.8	1.33	1.15
6	7.1	6.5	1.17	1.09
7	8.4	6.3	1.20	.89
8+	9.6	4.8	1.06	.78

Table B-14

Birth Order and Number of Younger Siblings

Birth Order and Younger Siblings	Retarded	Normal
Birth Order		
Only child	3.5%	3.5%
Oldest child	27.0	20.0
Youngest child	20.0	40.0
Other	50.0	36.0
Number of Younger Siblings		
0, 1	52.5	77.6
2, 3	36.5	20.7
4+	11.0	1.7

siblings whereas only about 20 percent of the normal children had more than one younger sibling. Thus, the data on birth order as well as that on over-crowdedness suggest that the retarded children receive less attention from their parents than the children in normal families. The age discrepancy between parents and the instability of marriage are consistent with this interpretation of lack of attention and affectionate behavior in the case of the retarded children.

Parental Motivation

One of the complaints about children who are regarded as culturally deprived is that they lack motivation in school. Therefore, one of the important questions to be raised is: to what extent do parents provide academic motivation for the child. Two parts of the interview relating to family background may shed light on this problem. First, each mother was administered a scale which described the extent to which a child constitutes a problem to her. This scale, developed by Farber (1960) for his study of families with severely retarded children, is described in Table B-15. (See also Farber, Jenne, & Toigo, 1960). A study by Vogel & Bell (1960) suggests that parents frequently project their difficulties upon one of their children and, as a result, this child develops a variety of personality or intellectual difficulties. A second element in parental motivation is their aspiration with respect to the educational attainment of their child. The higher the attainment expected by parents, the more they would generally attempt to inject this motivation into their children. However, probably in a lower socioeconomic class sample, although high educational aspiration may be verbalized, little may be done to make it a reality.

Table 8-15

Extent to which Mother Regards Child as a Problem

(By Scale Type)

Scale Type[b]	Retarded	Normal
0	32.2	53.5
1	20.3	20.7
2	18.6	10.3
3	17.8	8.6
4	11.1	6.9

NOTE.--Results from the population of the project were compared with those which Farber had derived upon 450 mothers of severely retarded children (1960).[a] The coefficient of reproducibility exceeded 90 percent for Farber's sample, exceeded 89 percent for the parents of EMR children and 88 percent for the parents of the normal children. The instrument was thus applicable to the population of this project. Other data were gathered which tended to indicate that the meaning of the scale items was essentially the same for the mothers of the normal educable and severely retarded children. Statistical analysis indicated that the impact of the child upon the mother varied directly with the severity of the child's retardation.

[a] Farber, B. Perceptions of crisis and related variables in the impact of a retarded child on the mother. J. Hlth. Human Behav., 1960, 1, 108-118.

[b] Scale Types based on agreement with statements:

a. (Child's name) needs patience and understanding.
b. (Child's name) is hard to handle.
c. I feel worn out from taking care of (Child's name).
d. My life revolves around (Child's name).

Scale Types computed as follows:

0 - answered no to a, b, c, and d.
1 - answered yes to a.
2 - answered yes to a & b.
3 - answered yes to a, b, and c.
4 - answered yes to a, b, c, and d.

The information on the extent to which the mother regards the child as a problem is presented in Table B-15. According to the table, there is a tendency for mothers of retarded children to regard them as more of a problem than mothers of normal children. In addition, responses to the scale by mothers with a child in the special class were compared with responses by mothers with children in the control group of retarded children. There was little difference between these two groups. The finding suggests that the school's labeling the child as a "problem child needing special attention" has little bearing upon the mother's attitude toward the child. Apparently, the child had been making greater demands on the mother even before the official designation. Under these conditions, it seems reasonable that the mother will not attempt to motivate the child highly toward intellectual academic achievement.

The second factor related to achievement was parental aspirations with respect to the child's educational achievement. Findings related to educational aspiration are presented in Table B-16. About 10 percent of the parents did *not* expect their mentally retarded children to graduate from high school, while all of the parents of normal children expected their child to be at least a high school graduate. Unexpectedly, about 70 percent of the parents of the retarded thought their child *would* graduate from high school. Since most of the parents in the retarded group are not themselves high school graduates, they may not realize the academic expectations in high school. The interpretation of lack of awareness is supported by the report of 21 percent of the parents of retarded children who expected their child to attend college. This lack of awareness was further indicated in the course of the interview by parents of retarded

Table 8-16

Parents' Educational Expectations for Children

Expectations	Retarded	Normal
Less than high school	9.3%	
High school graduate	69.5	55.2
College attendance	21.2	44.8

children who expected their children to enter professional occupations. These parents apparently were unable to comprehend the requirements of these occupations and their educational prerequisites. Since these parents do not seem to understand the nature of the educational process required for high school or college graduation, it is unlikely that they can provide the motivation to stimulate their children in academic and intellectual pursuits.

Summary and Conclusion

An investigation was made of the family background of the 120 mentally retarded children in the study. To indicate possible social and cultural factors in the development of mental retardation, these children were compared with the 60 normal children of comparable socioeconomic status living in the same neighborhoods. Findings indicated that families with retarded children showed a lower level of integration into the community, provided less adequate resources in the home, were characterized by family relationships reflecting instability, inattentiveness, and overcrowding, and were less capable of motivating the children intellectually and academically.

The lower level of integration of the retarded families in the community was indicated by (a) less participation in voluntary associations, (b) membership in isolated religious sects rather than in major denominations, (c) less church attendance, (d) less contact with friends and neighbors, and (e) greater residential mobility.

The inadequacy of parental resources in the retarded group was indicated by (a) low level of education of the parents, (b) low income per family member, (c) slightly greater reliance upon welfare agents, (d) poorer health of the mother, and (e) less exposure to mass communications media such as movies, magazines, and newspapers, as well as (f) the lack of a telephone in the home.

The inadequacy of family relationships in the retarded sample was suggested by (a) greater amount of remarriage, (b) frequency of birth of the retarded child prior to the current marriage, (c) large age discrepancy between husband and wife, (d) the greater tendency for the mother to be a teenager when the child in the study was born, (e) overcrowdedness of the home, and (f) the tendency to be a middle-child with several younger siblings rather than an oldest or youngest child.

Finally, inadequate motivation by the parents was suggested by (a) the tendency for the mother to regard the retarded child as a problem child, and (b) either the expectation of low academic achievement for the child or aspirations which indicate that the parent does not comprehend the nature of the educational process.

The findings suggest that a least a large number of the educable mentally retarded children in the study can be characterized as culturally deprived with respect to the dominant culture of the society. However, the label of cultural deprivation does not exclude other factors from involvement in the mental retardation nor should it suggest that these families exist without a culture. It merely indicates that these families are not active participants in the institutions which reflect the dominant culture in our society. In conclusion, the discussion has emphasized the major trends of the data. At the same time, the tables reflect much variation in the retarded sample on all characteristics described. Thus, while the tendencies toward cultural deprivation exist, many of the families are involved in at least some of the institutions which reflect the dominant culture of the society.

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APPENDIX C

The Psycholinguistic Abilities of Children Whose IQ's Are Below Average[1]

Retardation in language development and general communication skills is a frequently cited characteristic of low-IQ children. However, few experimental studies of the language abilities of these children or effects of training these abilities are available. In a recent review of the literature relating to language of the mentally retarded, Smith (1962, p. 40) reports "Only five studies could be found....Four...dealt wholly or partially with institutionalized children, while the fifth reported upon only three subjects.....In short, no experimental study was reported using control groups and standardized measures to study the effectiveness of language development programming for day school EMR children."

Smith (1962) investigated the effects of a three-month language training program on the language age of sixteen educable mentally handicapped children (ages 7 to 10; IQ's 50-80) enrolled in special classes. The experimental children were taken from the special class in groups of eight, for three 45-minute training sessions each week. Their performance on the Illinois Test of Psycholinguistic Abilities (McCarthy & Kirk, 1961) was compared to that of their matched pair controls (also in special classes) who did not receive the language program. The total language age of the experimentals increased significantly more during the training period than did that of the controls. There was, in fact, a noticeable lack of change in the language performance of the control children during the three-month period. Smith suggests (1962, p. 39) "If language development had been a basic or even incidental part of the regular (special class) curriculum for these children, the effects should have been apparent at the time of posttesting. It would be of interest to study the comparative effects over a longer period of time of both special and regular class placement upon the psycholinguistic abilities of EMR children."

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[1] Prepared by Dr. Barbara Bateman, on staff of Institute for Research on Exceptional Children.

Statement of Problem

The purpose of this investigation was to examine the psycholinguistic performance of children whose IQ's were below average when they were placed in regular grades and in special classes.

The following problems were investigated:

1. Do these children differ psycholinguistically from average children of comparable mental and chronological age?
2. Are there differences between the psycholinguistic profiles of children of various IQ levels?
3. Are there differences between the psycholinguistic profiles of the children in special classes and those in regular grades (a) after 1½ years, and (b) after 3 years of such placement?
4. Are there differences between the psycholinguistic performances of urban and rural low-IQ children, disregarding type of educational placement?

Methodology

Subjects and Procedure

The Illinois Test of Psycholinguistic Abilities (ITPA) (see Kirk & McCarthy, 1961, for description) was individually administered in February, 1961, and again in September, 1962, to 49 low-IQ children in regular grades and 40 low-IQ children in special classes. These children were all identified as mentally retarded or of borderline intelligence when they entered the first grade (fall, 1959) in locales where no special classes had been available previously. By random assignment, half of the children were placed in four newly organized special classes and the other half in regular grades. At the time of placement, the special class group's mean Binet IQ was 74.0, and mean CA 6-4. The regular grade group's mean IQ was 78.1 and mean CA 6-6. By April, 1961, however, the mean IQ of the special class subjects had increased to 81.0 and that of the regular grade subjects to 84.2.

Test

The ITPA is an individually administered diagnostic test of psycholinguistic abilities. Its nine discrete subtests measure the following facets of psycholinguistic development: (1) Auditory decoding--the ability to understand what is heard; (2) Visual decoding--the ability to understand what is seen; (3) Auditory-vocal association--the ability to draw relationships from what is heard; (4) Visual-motor association--the ability to draw relationships from what is seen; (5) Vocal encoding--the ability to express ideas verbally; (6) Motor encoding--the ability to express ideas manually; (7) Auditory-vocal automatic--the ability to use the structure of language (grammar) automatically; (8) Auditory-vocal sequential--the ability to reproduce a series of symbols presented auditorily; (9) Visual-motor sequential--the ability to reproduce a series of symbols presented visually.

Results

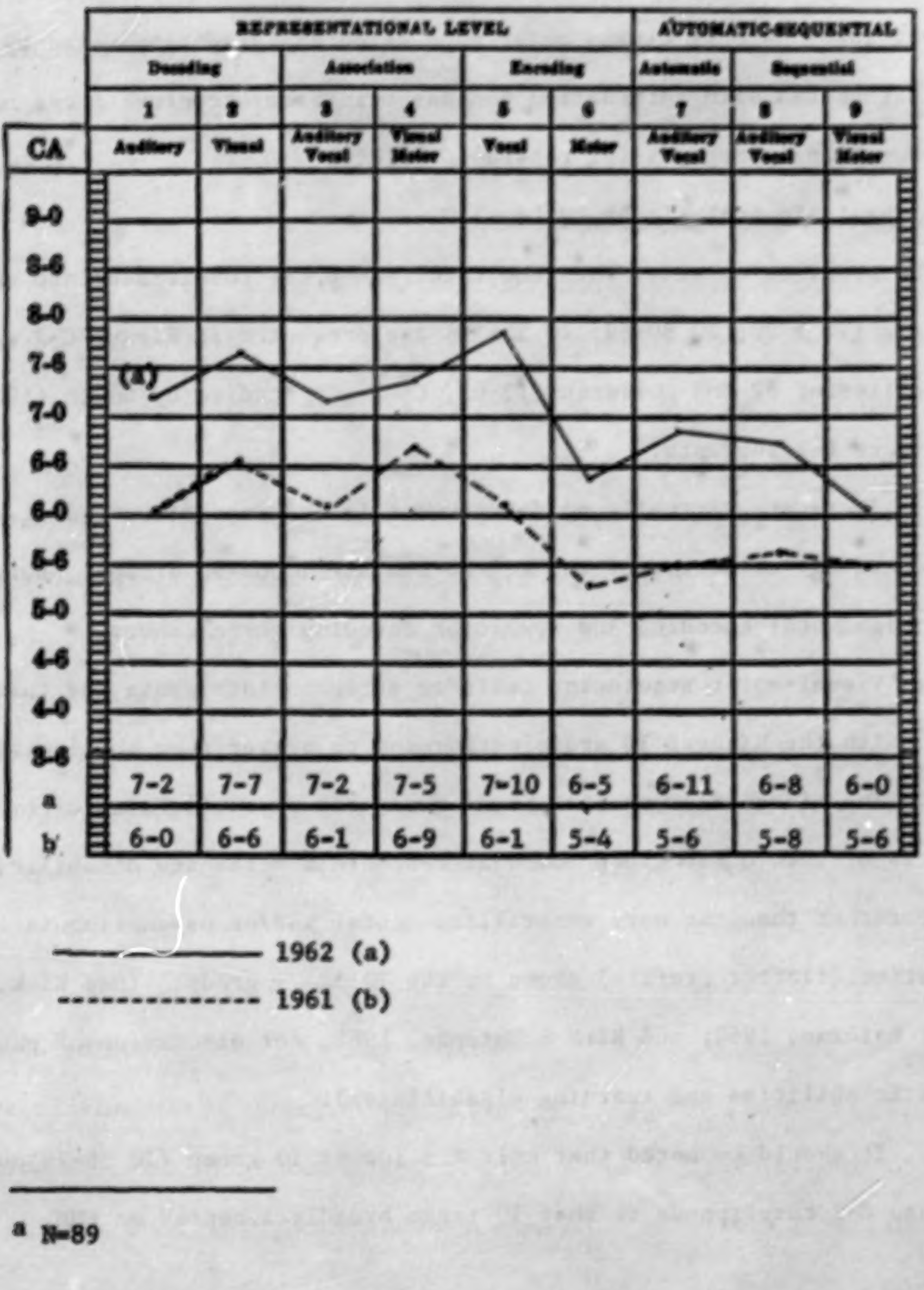
The psycholinguistic profiles of the 89 children in this experiment as obtained in February, 1961, and September, 1962, are shown in Figure C-1. Both profiles show relative deficits in motor encoding and in the automatic-sequential level. The two profiles are strikingly similar, indicating that the pattern of psycholinguistic abilities of these children was quite constant over the 19-month period. At the time of the first testing (February, 1961), the mean total language age of the group was 5-10 years (mean CA 7-10 years). Nineteen months later (September, 1962), the mean total language age had increased to 7-0. Thus, during the 19-month interval, language age increased 14 months.

Psycholinguistic Comparison of Study Subjects and Normal Children

The fact that both profiles reveal relative weakness in the automatic-sequential level may be of some importance. Although only two supporting studies have been reported (Kass, 1962; Bateman, 1963) thus far, there are also strong clinical suggestions that the automatic-sequential functions are highly related to school achievement, while the representational level functions are not. The fact that these children performed better on the subtests at the representational or meaningful level of language usage (subtests 1-6) than at the automatic-sequential level (subtests 7-9) suggests: (1) possibly a greater training or educational emphasis on meaningful than on automatic language usage; (2) greater "actual" retardation or developmental lag in the habitual or automatic manipulation of linguistic symbols; or (3) the test tasks at the automatic-sequential level are less motivating to retarded children than to the standardization population.

Figure C-1

ITPA Profiles of Low-IQ Subjects - 1961, 1962[a]



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[a] N=89

The relatively low performance in motor encoding (Figure C-1) might be related to a lack of familiarity with some of the test items, which in turn could be related to a presumably lower socioeconomic class background of the group as a whole compared to the standardization subjects. However, inadequate or clumsy motor expression has also been noted by many to be associated with retardation and has even been a central focus of some educational programs for retarded children.

Psycholinguistic Analysis by IQ Level

The profiles obtained when the total group was subdivided into three IQ levels ($IQ > 90$; IQ 80-89; IQ 58-79) are presented in Figure C-2 with the profiles of 32 EMH children ($\overline{IQ}$ 68, $\overline{CA}$ 8-11) studied by Smith (1962).

Figure C-2 suggests:

1. There are virtually no differences in the expressive (vocal and motor encoding) abilities of the $IQ > 90$ and the IQ 80-90 groups. Both reveal high vocal encoding and low motor encoding performances.

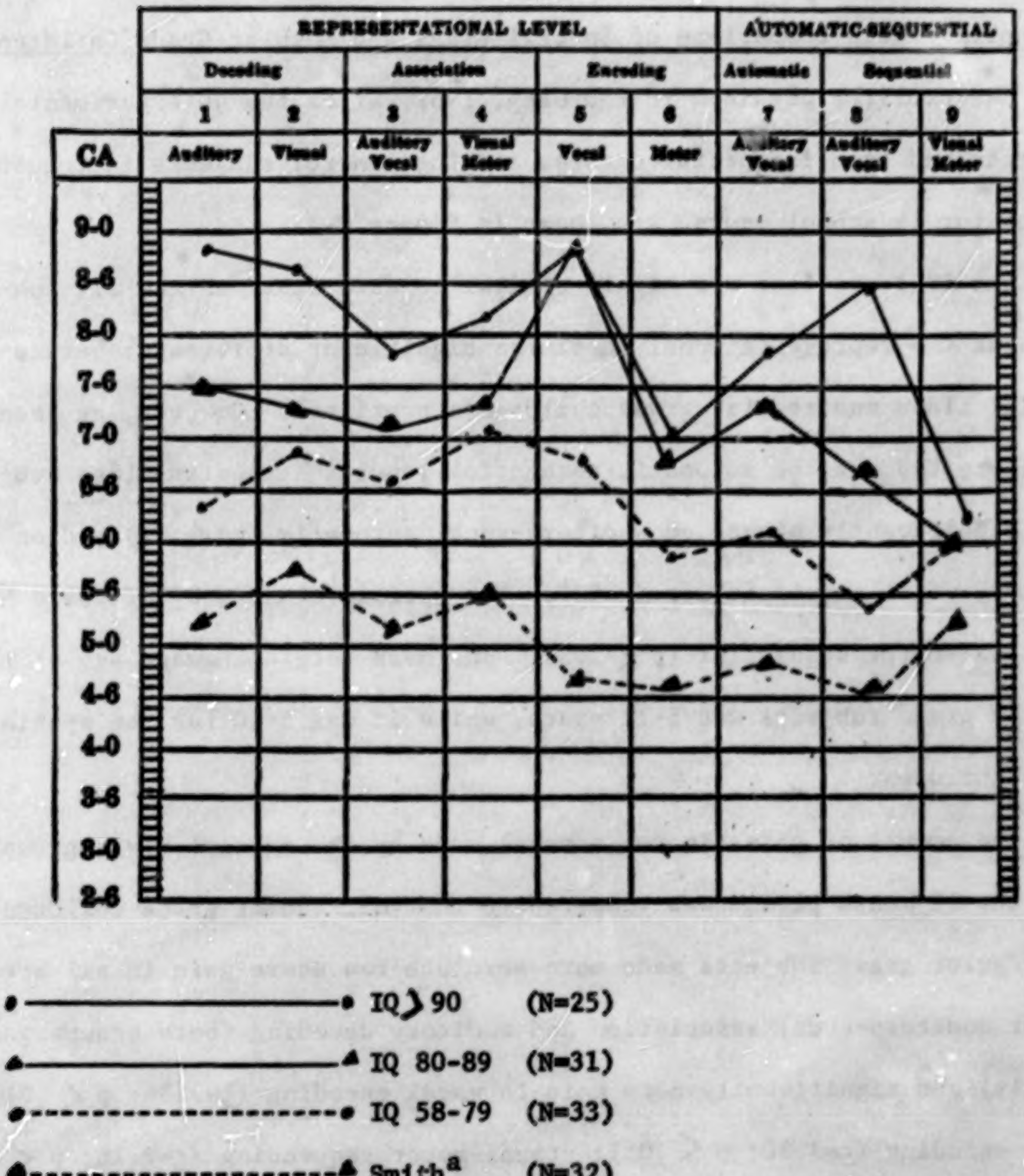
2. Visual-motor sequencing fails to differentiate among the three groups, with the highest IQ group performing no better than the lowest.

3. The wider discrepancies found among the psycholinguistic performances of the $IQ > 90$ group somewhat resemble a "learning disability" profile rather than the more generalized mental and/or psycholinguistic retardation (flatter profile) shown by the IQ 58-79 group. (See Kirk, Kass, & Bateman, 1962; and Kirk & Bateman, 1962, for discussion of psycholinguistic abilities and learning disabilities).

4. It should be noted that only the lowest IQ group (IQ 58-79) shown in Figure C-2 corresponds to that IQ range broadly accepted as EMH.

Figure C-2

ITPA Profiles by IQ Level



[a]Smith, J. O. **Effects of a group language development program upon the psycholinguistic abilities of educable mental retardates.** Spec. Educ. Res. Monogr., 1962, No. 1.

The trend toward deficits in motor encoding and the automatic-sequential level tests is most evident for the lowest IQ range. The general applicability of this profile for the IQ 58-79 group is strengthened by the findings of Smith (1962). When his pretest ITPA data for the 16 experimental and 16 control EMH children ($\overline{IQ}$ 68) are pooled, the resulting profile (Figure C-2) is highly similar to that obtained in the present study.

Psycholinguistic Comparison of Special Class and Regular Grade Children

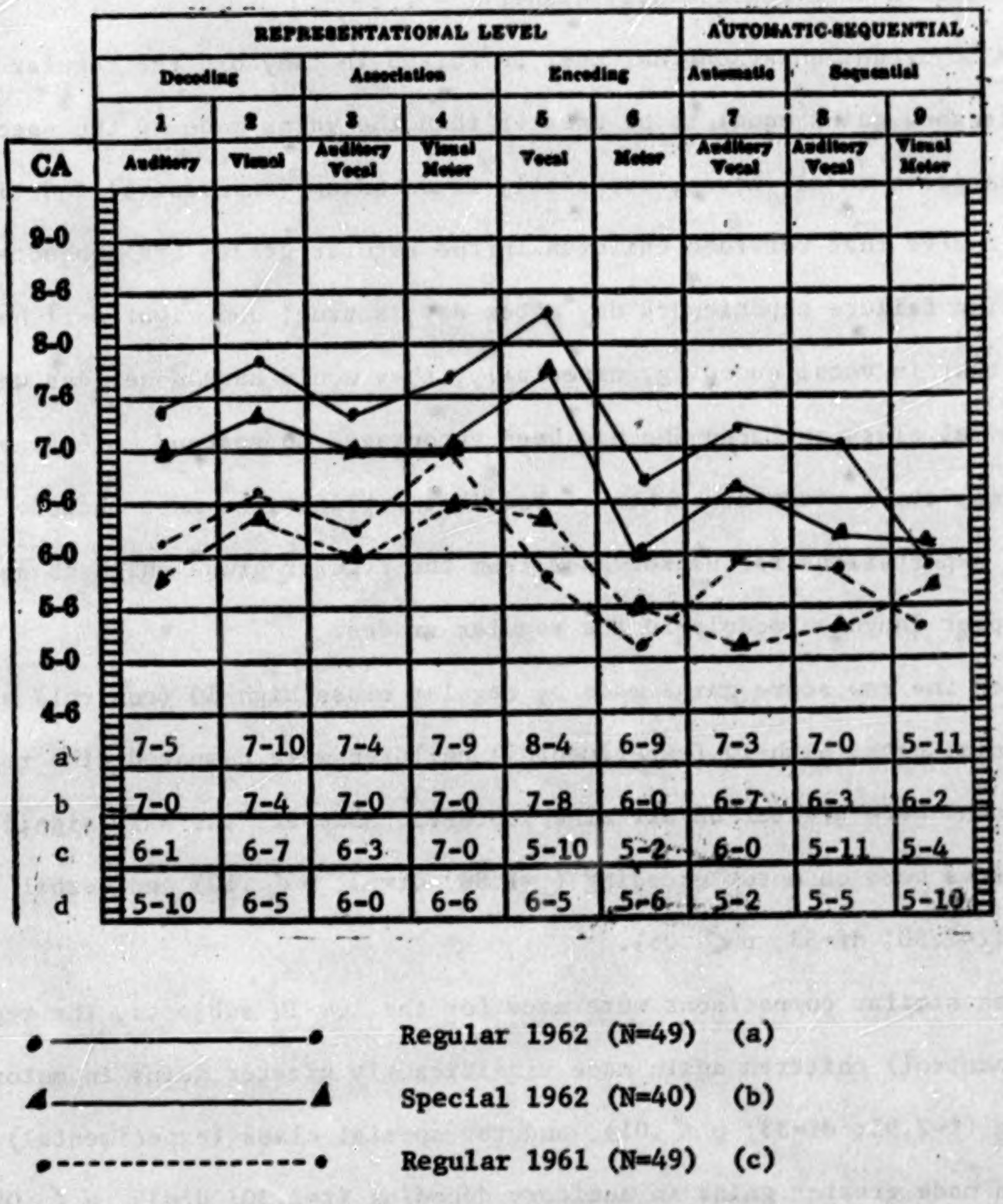
The profiles obtained in February, 1961, after the 40 experimental subjects had been in special classes and the control subjects in regular grades for 1½ school years, are shown in Figure C-3.

The 1961 profiles are highly similar to each other on the six subtests at the representational level (no significant differences between special class and regular grade children's profiles). However, as seen in Figure C-3, at the automatic-sequential level the regular class subjects were significantly higher on auditory-vocal automatic ($p < .02$) and on auditory-vocal sequential ($p < .02$). The special class subjects were higher on visual-motor sequential ($p < .05$). The mean total language age of the regular grade subjects was 5-11 years, while it was 5-10 for the special class children.

The amount of gain (in raw scores) made by the special class group over the 19-month period was compared to that of regular grade children. The regular grade subjects made more absolute raw score gain in all areas except auditory-vocal association and auditory decoding (both groups gained equally) and significantly more gain in vocal encoding ($t=3.34$; $p < .01$); motor encoding ($t=3.30$; $p < .01$); visual-motor sequencing ($t=2.18$; $p < .05$); and total language score ($t=2.52$; $p < .02$). (See Figure C-3.)

Figure C-3

ITPA Profiles of Regular Grade and Special Class Subjects



CA	1	2	3	4	5	6	7	8	9
a	7-5	7-10	7-4	7-9	8-4	6-9	7-3	7-0	5-11
b	7-0	7-4	7-0	7-0	7-8	6-0	6-7	6-3	6-2
c	6-1	6-7	6-3	7-0	5-10	5-2	6-0	5-11	5-4
d	5-10	6-5	6-0	6-6	6-5	5-6	5-2	5-5	5-10

The shapes of the profiles for the two groups are almost identical to each other in 1962. The special class and regular grade children, after 19 months, became more alike in their patterns of psycholinguistic strengths and weaknesses, but less similar in level of function, where the regular grade children were consistently higher.

An important question that must be raised in "Why did the regular grade subjects show gains equal to or greater than the gains made by the special class subjects in all areas, especially in encoding (expressive) functions." If the charge that retarded children in the regular grades are subjected to inhibiting failure experiences day after day is true, one might well have predicted that in vocal encoding, especially, they would have done less well than the special class children who had been encouraged to respond more freely in an accepting, small-class atmosphere. Possible explanations must include higher teacher expectations for performance from the regular grade children and/or better peer language models in the regular grades.

When the raw score gains made by regular class high-IQ (control) and the special class high-IQ (experimental) children were compared, the regular class gains were greater on all nine subtests; however, the only significant differences were on motor encoding ($\underline{t}=1.88$; df=53; $p < .10$) and verbal encoding ($\underline{t}=2.50$; df=53; $p < .05$).

When similar comparisons were made for the low-IQ subjects, the regular class (control) children again made significantly greater gains in motor encoding ($\underline{t}=2.95$; df=33; $p < .01$), and the special class (experimental) children made greater gains in auditory decoding ($\underline{t}=2.30$; df=35; $p < .05$). No other differences were significant, but it is noteworthy that the special class subjects' mean gain excelled that of the regular grade children in four of the nine subtests, while the high-IQ special class children failed to equal the regular class subjects' gain on any subtest. These data are summarized in Table C-1.

Table C-1

Mean ITPA Raw Score Gains

Group	N[1]	Aud. Voc. Auto.	Vis. Dec.	Mot. Enc.	Aud. Voc. Assn.	Vis. Mot. Seq.	Voc. Enc.	Aud. Voc. Seq.	Vis. Mot. Assn.	Aud. Dec.
High-IQ										
Control	34	4.1	2.3	3.1	2.65	1.6	7.0	3.25	2.35	5.55
Experimental	21	3.8	1.6	1.4*	2.4	1.0	2.0**	2.40	1.60	3.5
Low-IQ										
Control	16	3.4	2.2	4.2	3.05	2.6	2.5	3.25	2.5	.19
Experimental	19	3.5	1.9	1.3***	3.25	1.3	5.1	2.7	1.7	4.5**

* $p < .10$
** $p < .05$
*** $p < .01$

[1] The total N for this analysis is 90, rather than 89, as ITPA data were found for one additional subject.

These findings confirm the general picture that regular class placement is more conducive to psycholinguistic growth than is special class placement.

They also support, to a limited extent, the possibility that special classes are more beneficial to the lower IQ subjects than the higher. However, the only area in which the low-IQ special class subjects made greater gains than their counterparts in regular classes was in auditory decoding.

Table C-1 shows that the regular class subjects made no gains at all in auditory decoding during the 19-month interval. This suggests that they perhaps were less willing to guess at unknown items and had actually become more aware of the meaning of the spoken word.

Rural-Urban Comparison

An analysis of the 89 subjects by rural or urban residence, regardless of school placement, is shown in Figure C-4. There are no significant differences between the test performance of the rural and urban children on either the 1961 or 1962 testings.

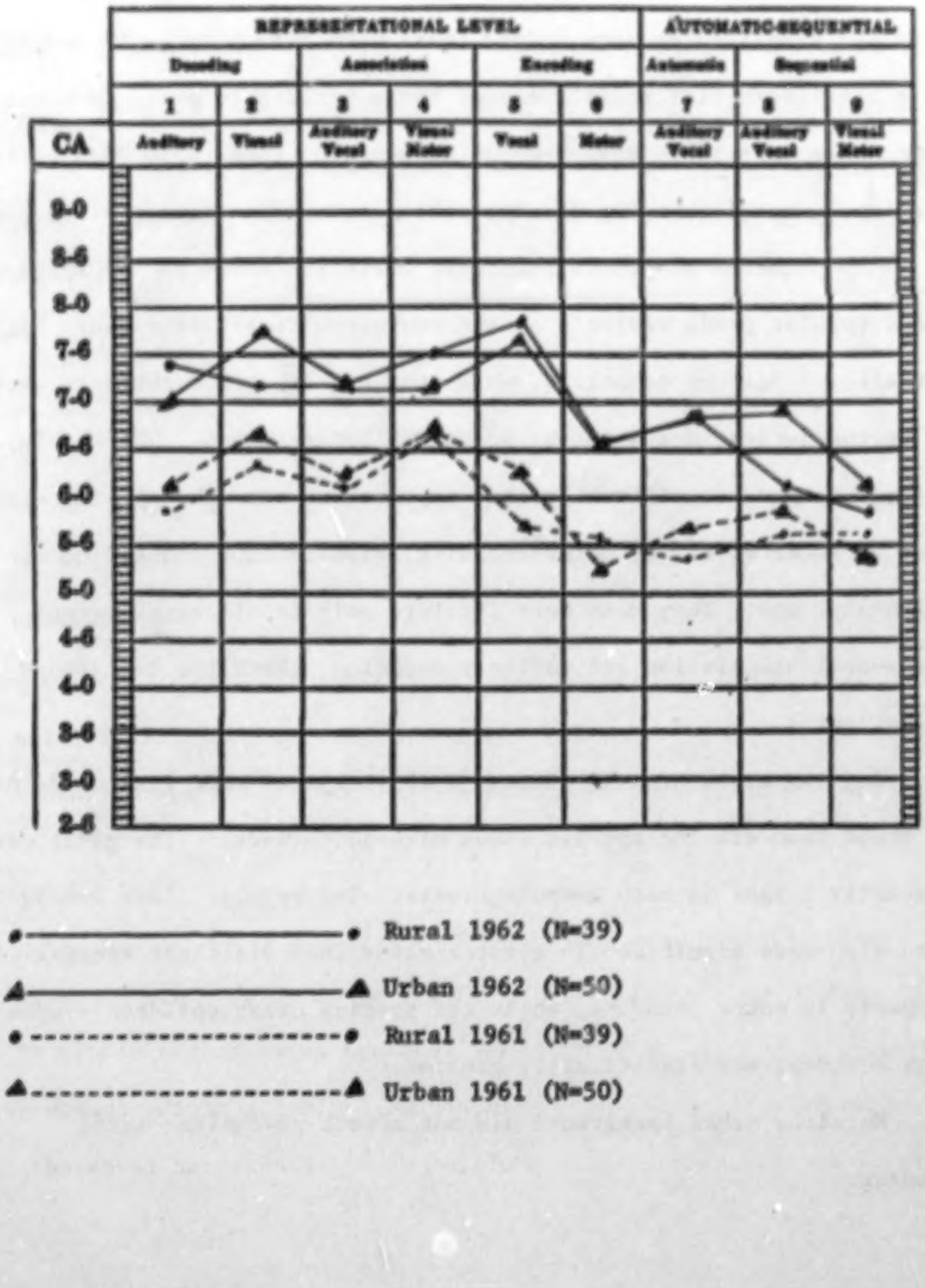
Thus, rural or urban background does not appear to be a factor which significantly affects psycholinguistic abilities. The striking pattern similarities seen in all four profiles (Figure C-4) strengthen the impression that (1) differences noted in special class and regular grade subjects' profiles in 1962 are due to differential placement, not to an extraneous factor such as rural-urban background, and (2) the profiles obtained are reliably representative of such children's psycholinguistic performances.

Summary

The ITPA was administered to 89 children, 49 of whom were in regular grades and 40 in special classes. The test was given in the middle of their second year in school and again at the beginning of the fourth year. Analysis of the psycholinguistic profiles of these children revealed:

Figure C-4

ITPA Profiles of Rural and Urban Low-IQ Subjects



1. In general, psycholinguistic age scores were below mental age scores. Test performances for the total group were relatively constant over the 19-month interval between testings. Motor encoding and the automatic-sequential tests appeared to constitute areas of relative deficiency.

2. The children with IQ's above 90 showed marked deficits in motor encoding and visual-motor sequencing; those with IQ's between 80 and 90 showed a relatively flat profile except for a noticeable asset in vocal encoding and a deficit in visual-motor sequencing; those with IQ's below 80 were low in motor encoding and the entire automatic-sequential level.

3. The patterns of psycholinguistic abilities shown by the special class and regular grade subjects at the representational level were highly similar after a year of schooling, while the regular grade subjects were higher in two automatic-sequential tests and lower in one. The regular class subjects made significantly more improvement than the special class subjects in vocal encoding, motor encoding, visual-motor sequencing and total language age. They made more absolute gain in all areas except auditory-vocal association and auditory decoding, where the two groups made equal gains.

4. Regular class high-IQ (Binet $>$ 79) subjects made greater gains in all areas than did the special class high-IQ children. The gains were significantly larger in both encoding tests. The regular class low-IQ children also made significantly greater gains than did their special class counterparts in motor encoding, while the special class children's gain in auditory decoding was significantly greater.

5. Rural or urban background did not affect psycholinguistic functioning.

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APPENDIX D

Table D-1

Correlations and Beta Coefficients for Word Knowledge, Word Discrimination, and Reading Comprehension from the MAT; Gray's Oral Reading Paragraphs; Iota Word Recognition Test; Durrell's Tachistoscope Word Recognition Test; and the Word Discrimination and Sound Blending Tests from the Monroe Battery with Mental Age

Tests	N	r	b
Word Knowledge			
Experimental	39	.46	.288
Control	50	.51	.323
Word Discrimination (MAT)			
Experimental	40	.56	.326
Control	49	.53	.313
Reading Comprehension			
Experimental	40	.69	.280
Control	49	.55	.250
Gray's Oral Paragraphs			
Experimental	39	.47	.239
Control	50	.38	.211
Iota Word Recognition			
Experimental	39	.48	.438
Control	50	.57	.583
Word Discrimination (Mon.)			
Experimental	39	.51	.314
Control	50	.60	.433
Tachistoscope			
Experimental	39	.41	.359
Control	50	.48	.450
Sound Blending			
Experimental	39	.30	.081
Control	50	.52	.121

Table D-2

Correlation Coefficients and Beta Weights for Arithmetic Scores and Mental Ages (4th Year) for Experimental and Control Children

Groups	N	r	b*
Arithmetic Computation			
Experimental	40	.556	.282
Control	52	.722	.657
Arithmetic Concepts and Problem Solving			
Experimental	40	.531	.156
Control	50	.701	.334

*Significant differences ($p < .05$) between beta weights for experimental and control groups on both subtests.

Table D-3

Correlations Between Test of Basic Information Scores and Measures of Mental Age and Achievement for Experimental and Control Children

	Initial TOBI (2nd yr)[a]		Second TOBI (3rd yr)[b]	
Measures	Exper. (N=41)	Control (N=50)	Exper. (N=40)	Control (N=45)
Stanford-Binet, Form L				
Mental Age (S-B,L)	.64	.76	.49	.73
Metropolitan Achievement Test				
Word Knowledge	.20	.48	.28	.62
Word Discrimination	.04	.57	.50	.52
Reading Comprehension	.05	.62	.36	.50
Language	---	---	.29	.41
Spelling	---	---	.46	.44
Arithmetic				
Computation	.42	.71	.45	.58
Concepts & Problem Solving	---	---	.35	.63

[a] Initial test correlations with 2nd year MA and achievement data.

[b] Second test correlations with 3rd year MA and achievement data.

APPENDIX E

Test of Basic Information[1]

Instructions for Administration

Pass out the test booklets and be sure that each child has a soft pencil or crayon and a piece of tagboard about 2" by 8" for a place marker. Have the children put their names on the front cover of the booklets. Where this is not practical the teacher should have the children's names already on the booklets before passing them out.

In the administration of this test the examiner must adhere strictly to the wording of the items. All other instructions to the class except for the actual items may be paraphrased as long as the original meaning is maintained and nothing is added or left out.

The first page of pictures is for practice and demonstration only and is not scored. The object of this page is to provide practice with the test materials and to instruct the children in the method of responding. The examiner should speak slowly, distinctly, and loudly enough to be easily heard by all the children. Test items may be repeated if there is any doubt that the children hear or understand. The test is not timed but should progress as rapidly as practical.

Demonstration Items

The examiner should tell the children to open their booklets to the first page of pictures and fold the booklet back. The examiner should hold her own folded booklet up to demonstrate and make sure that each child is on the appropriate page.

Ask the children to find the kitty at the top of the page and put a mark on it with their crayons. See that everybody does this and look to make sure that the mark is dark enough and well enough placed.

Have the children place their markers under the first row of pictures and make sure that all have them correctly placed.

Say: Look at the first row of pictures. There is a hair pin, a safety pin, a nail, and a paper clip. These are all things you might find around the house. Put a mark on the one made to fasten pieces of wood together.

Ask: "How many put a mark on the picture of a nail?" Say: "Yes, the nail is the one made to fasten wood together." Look to see if all the children made the correct response. If a child marks an incorrect picture, help him to find the right one.

---

[1] Moss, J. W. Test of Basic Information, experimental edition. Urbana: Inst. for Res. on Except. Children, Univer. of Illinois, 1962.

B. Say: Slide your markers down to the next row of pictures - below the books. Put a mark on the heaviest book.

Make sure that every child has made a mark. The teacher should hold up her own booklet pointing to the last picture in the row as she says: Did you put your mark on this one, the biggest one? Yes, the biggest one is the heaviest one.

C. Say: Slide your markers down to the next row of pictures. Put a mark on the picture of the thing that could hurt you if you used it wrong.

Look to see if everybody has marked the hammer. Ask: Did you all mark the hammer? Yes, the hammer is the one that could hurt you if you used it wrong.

D. Say: Slide your markers down to the next row of pictures. Put a mark on the baker.

Ask if everybody marked the picture of a man with a big hat and a cake. Where a child has marked the wrong picture he should be helped to find the right one.

E. Say: Slide your markers down to the last row of pictures. Put a mark on the picture of the room we wash dishes in.

Look to see that the children have marked their pictures correctly. Explain the item if any children have marked incorrectly.

****

The children are told that they will now go through the rest of the booklet with as little talking as possible and that no more help will be given. At the beginning of each item, the children are reminded to properly place their markers at the top of a new page or to slide them down.

Test Items

Say: Turn the booklet over and find the picture of a baseball at the top. Put a mark on it.

1. Mark the one that measures liquid.
2. Mark the picture of someone who is married.
3. Mark the picture that shows us winter.
4. Put a mark on the one that makes us healthy.

5. Put a mark on the one we measure distance with.

Say: Turn the page and fold the booklet back. Find the bicycle at the top and put a mark on it.

6. Mark the things that are bought most often.

7. Mark the picture that shows where wheat comes from.

8. Mark the narrow line.

9. These are all things we listen to. Mark the musical instrument.

10. Mark the one that makes a signal go off in the fire station.

Say: Turn the booklet over and find the dog at the top. Put a mark on it.

11. Mark the traffic signal that tells you to stop.

12. Put a mark on the one that could burn up. (Emphasize up.)

13. Mark the fastest way to get from Chicago to San Francisco.

14. Here are some squares with coins. Put a mark in the square with seven cents in it.

15. Mark the one that doesn't buy much.

Say: Turn the page and fold the booklet back. Find the apple at the top and put a mark on it.

16. Put a mark on the arrow that tells you to turn right.

17. Mark the coin that is worth two nickels.

18. Mark the arrow that tells you to turn to the left.

19. Mark the picture that shows where oil first comes from.

20. Here are pictures of things that go places. Mark the one that goes the fastest.

Say: Turn the booklet over and find the little car at the top. Put a mark on it.

21. Mark the one that costs the most money.

22. Here are four squares with coins in them. Put a mark in the square that has eleven cents in it.

23. Put a mark on the picture of the thing which makes heat.

24. Mark the one that shows what you might do in December.

25. Mark the picture that shows the best way to get from New York to England.

Say: Turn the page and fold the booklet back. Find the shoe at the top and put a mark on it.

26. Mark the picture that shows what birds first come from.

27. Mark the picture that shows what leather is made from.

28. Mark the picture that shows where electricity is made.

29. Here are some things you might find in different stores. Put a mark on the things you might find in a hardware store.

30. Mark the one that is usually sent first class.

Say: Turn the booklet over and find the clock at the top. Put a mark on it.

31. Mark the sign that says "North."

32. Mark the door that shows the men's washroom.

33. Mark the sign that warns that something may burn you.

34. Put a mark on the sign that tells you not to go in.

35. Mark the sign that says "Road Closed."

Say: Turn the page and fold the booklet back. Find the bird at the top and put a mark on it.

36. Mark the sign that tells a man to put out his cigarette.

37. Mark the sign that tells you where to catch a bus.

38. Mark the sign that would tell your mother where to find apples and oranges in the store.

39. Mark the sign that tells you where to go out.

40. Mark the sign that tells you to be careful.

For Experimental Purposes Only
This instrument may not be
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permission of the authors.

I.R.E.C.

TEST OF BASIC INFORMATION

Pupil's Name: ______________________________

Date of Birth: __________ Sex: ________ Grade: ________ Teacher: ________

School: ______________ City: ______________ Group: ______________

Examiner: ______________ Date Tested: ______________ No. __________

Scores

	Part 1	Part 2	Total
Raw Score	______	______	______
Percentile	______	______	______
Standard Score	______	______	______
______________	______	______	______
______________	______	______	______
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Institute for Research on Exceptional Children

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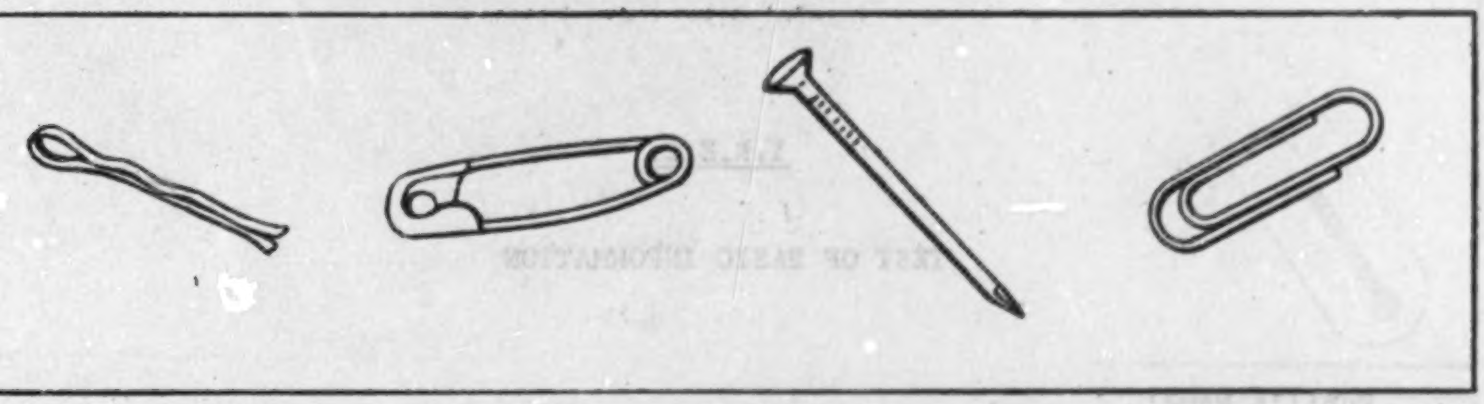

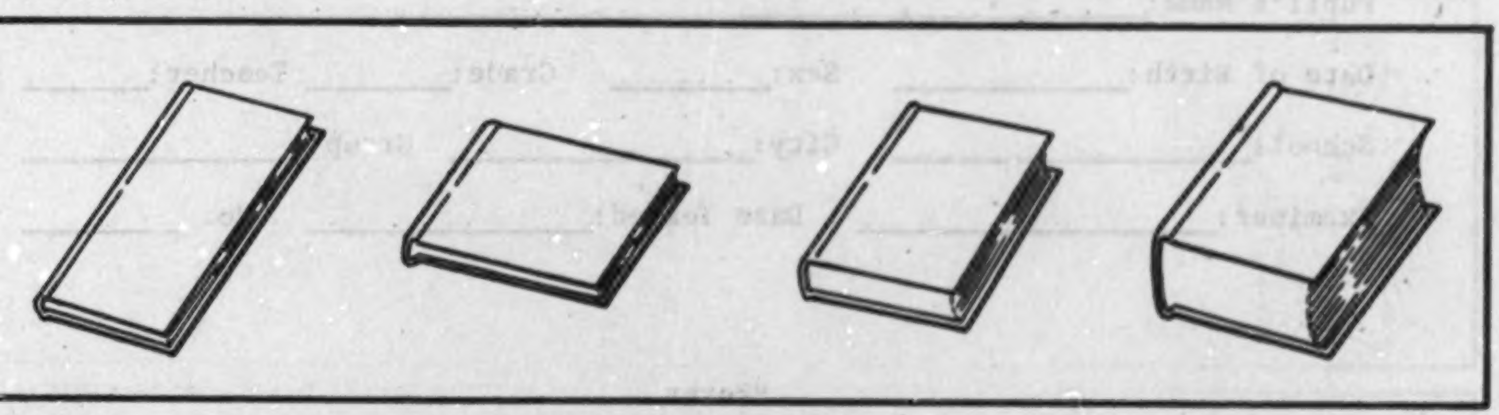

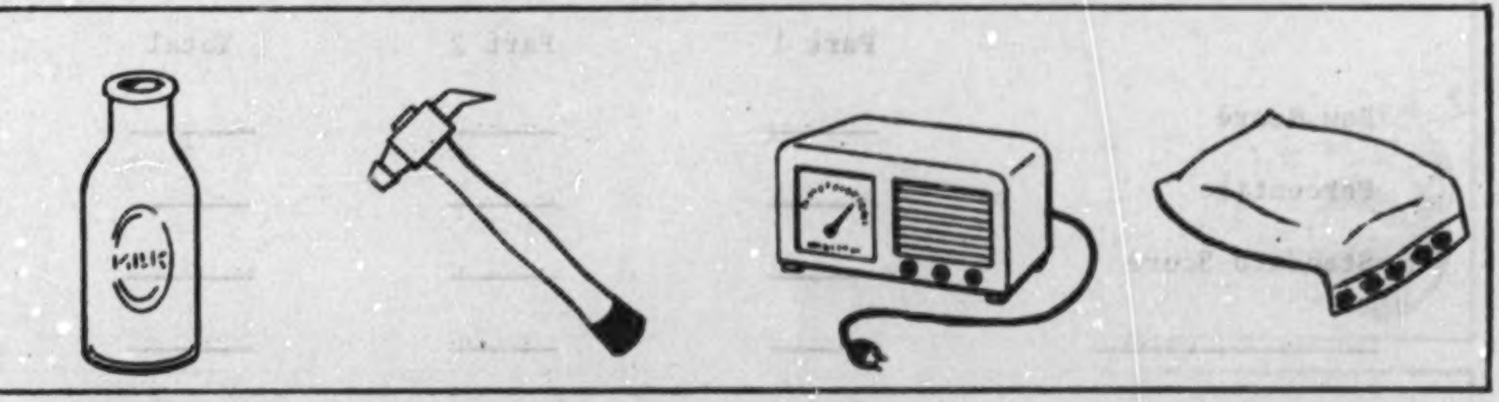

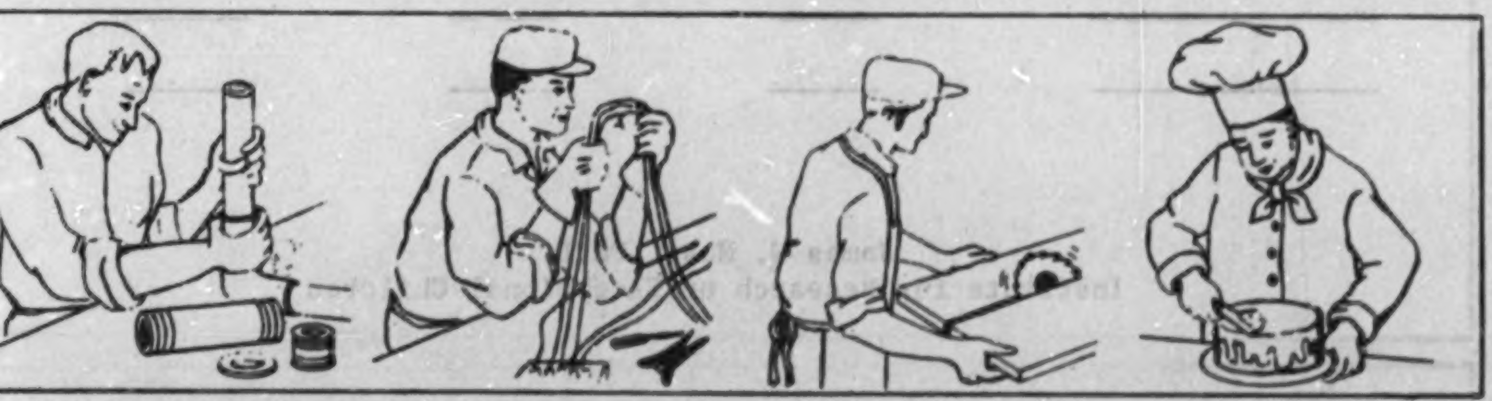

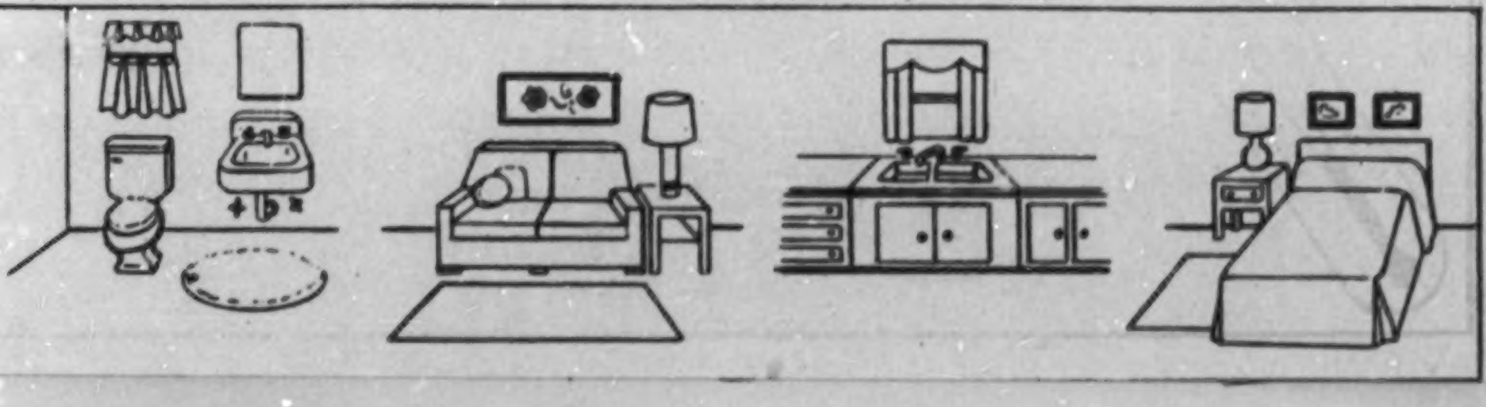

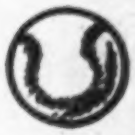

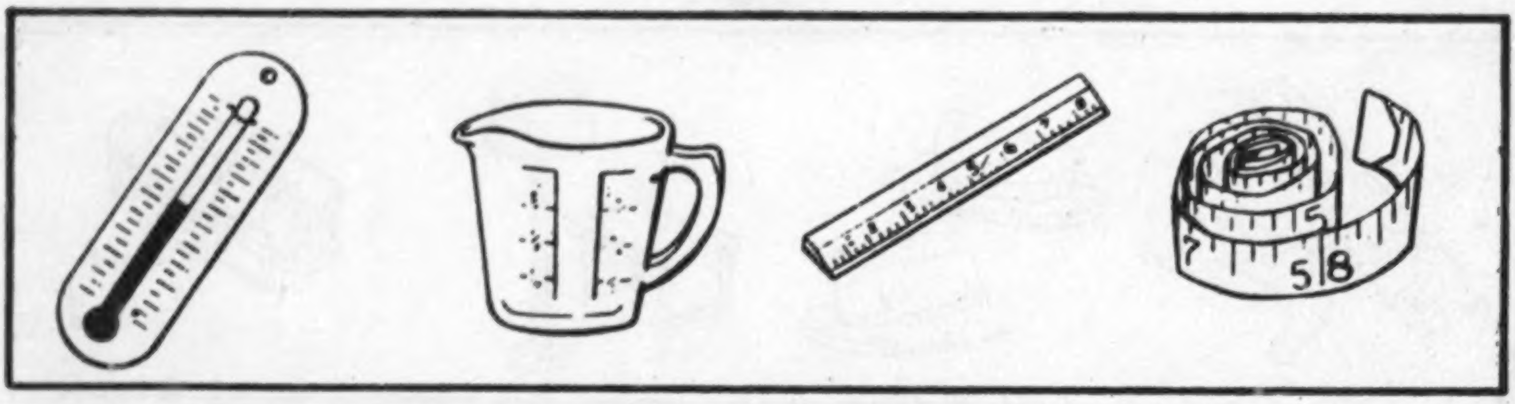
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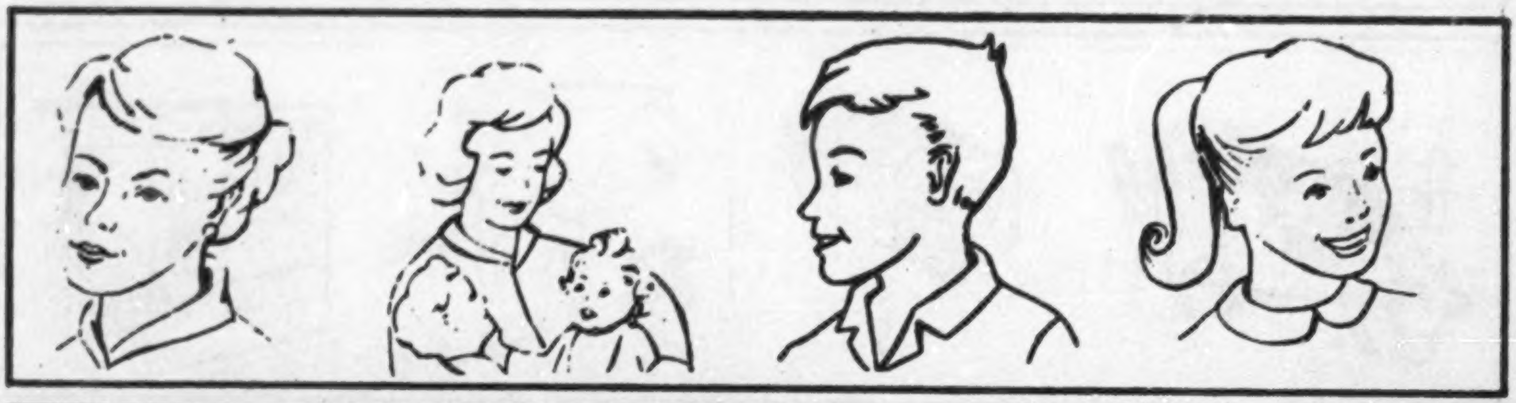

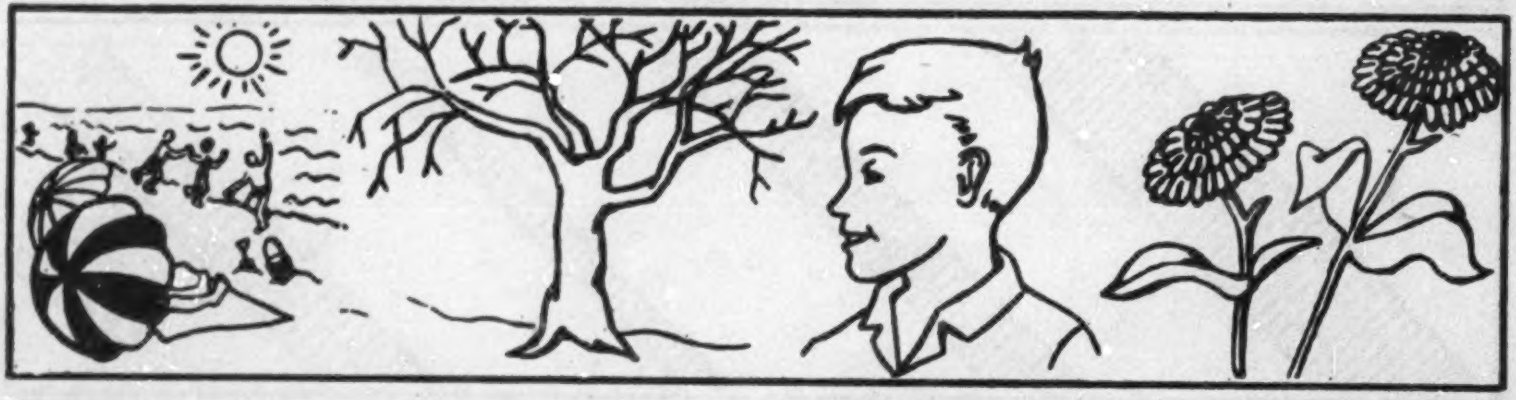

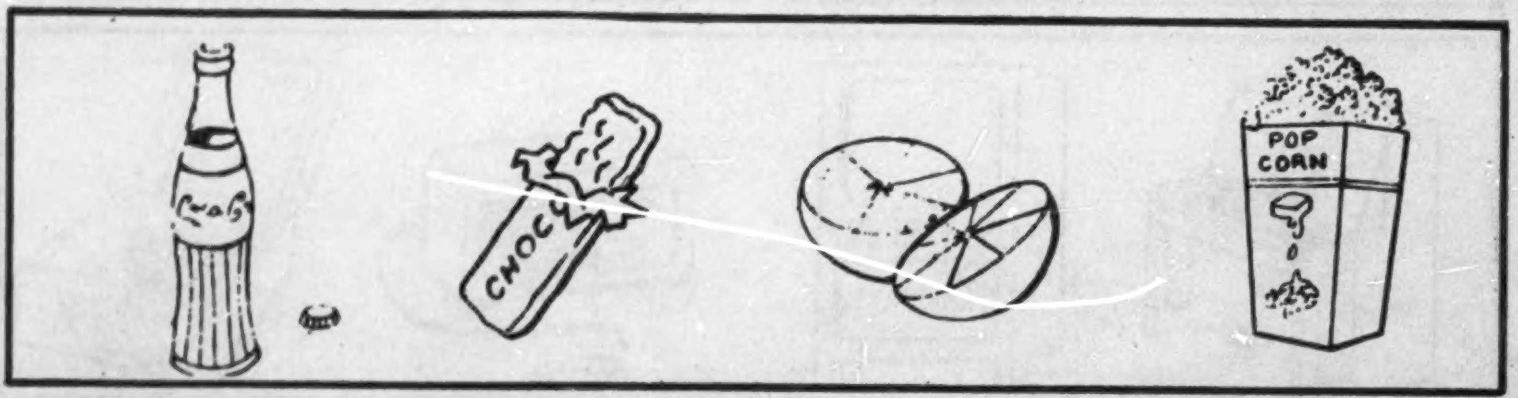
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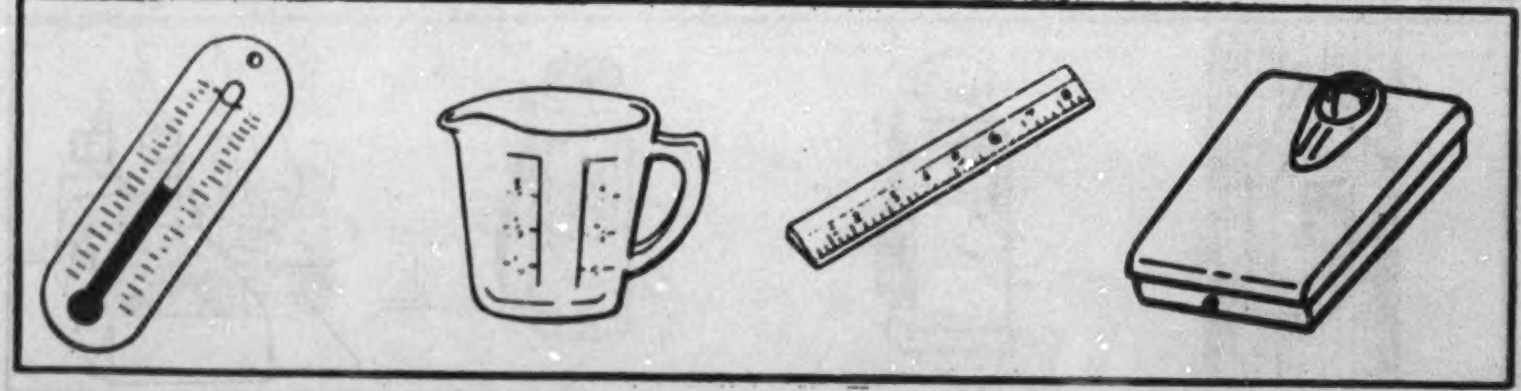
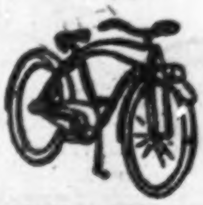
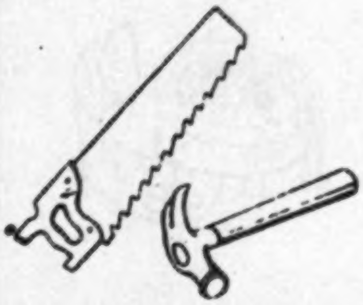
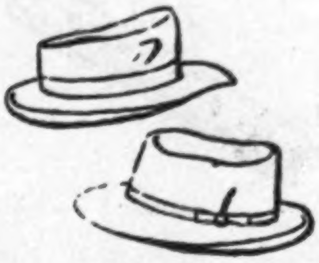
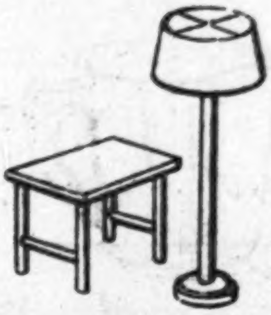
CHOC
POP CORN

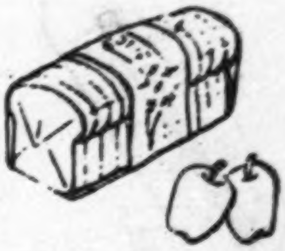


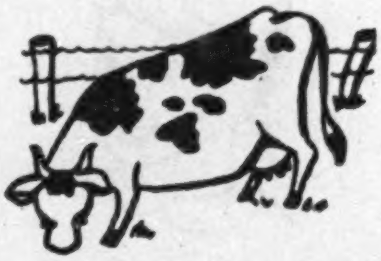


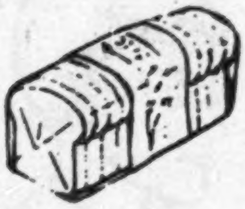


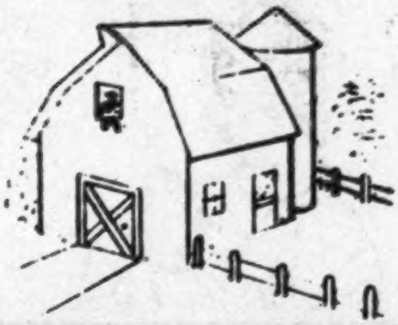


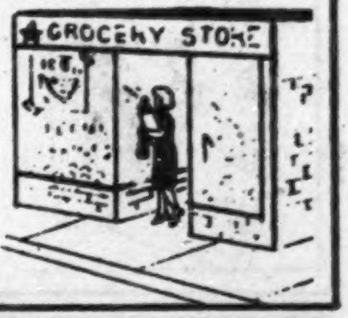


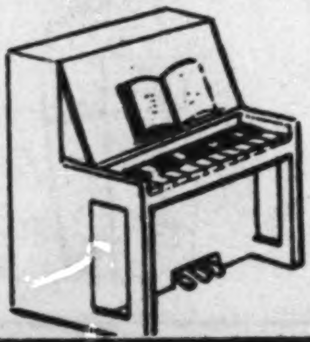


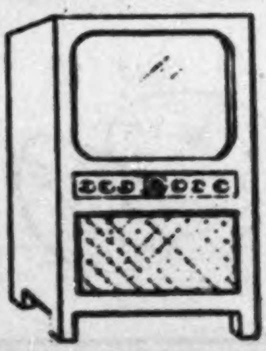


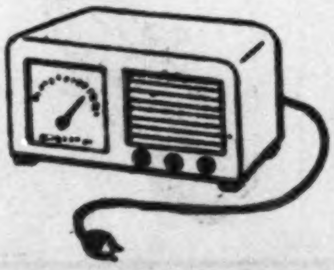


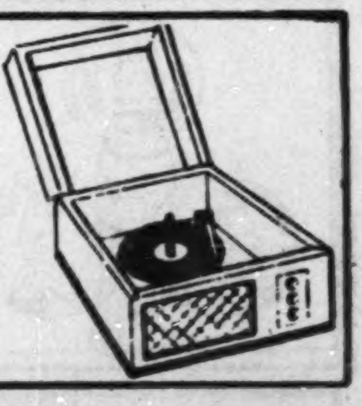


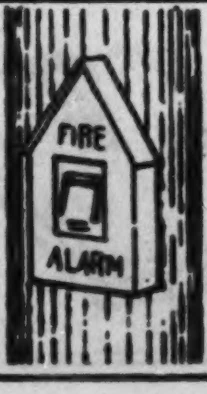

GROCERY STORE







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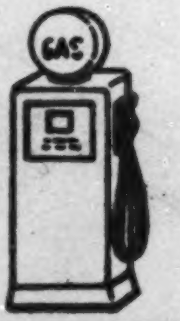
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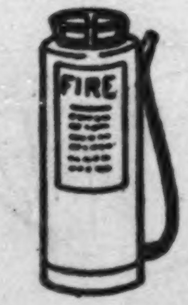
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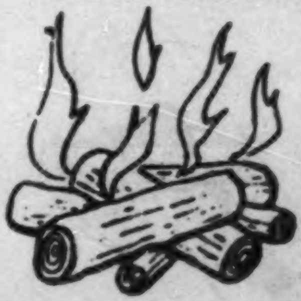

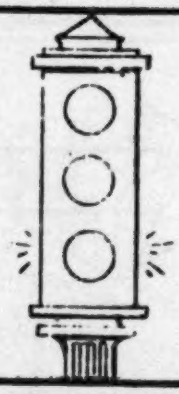

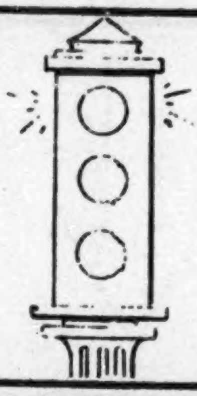

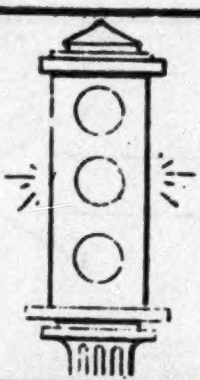

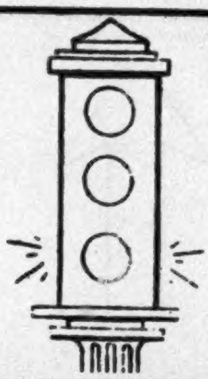

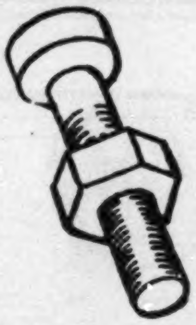

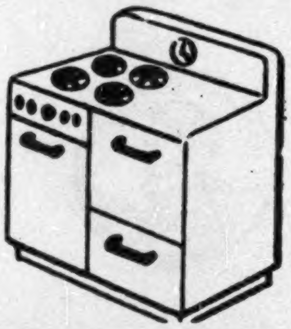

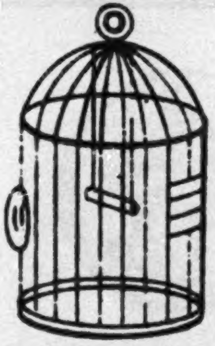

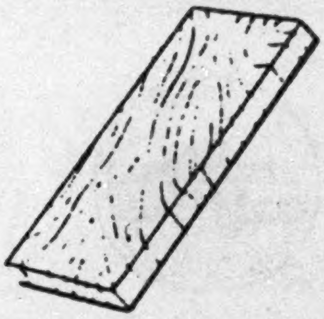

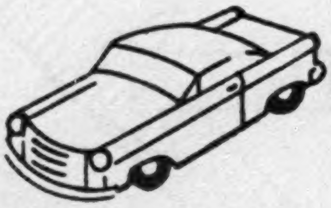

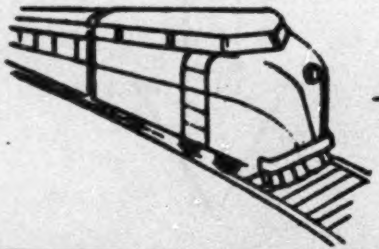

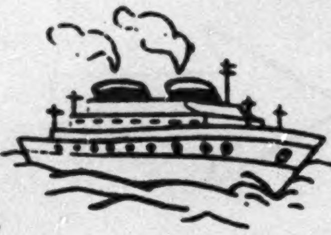

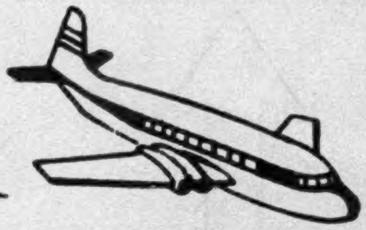

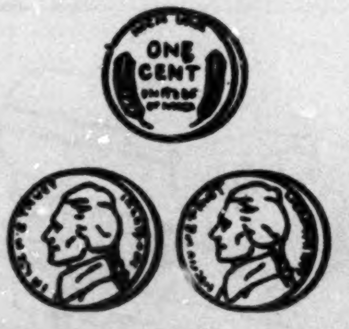
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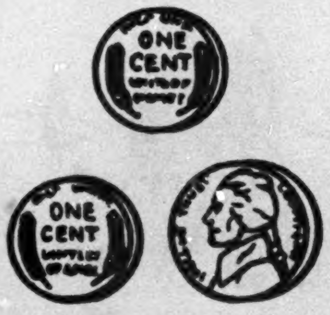
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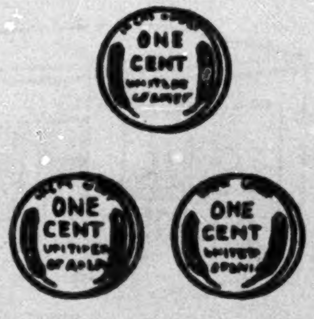
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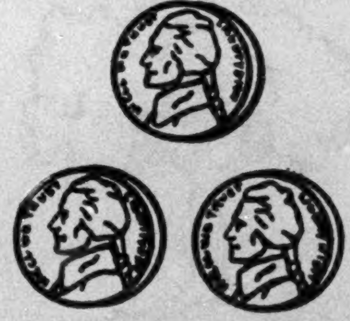

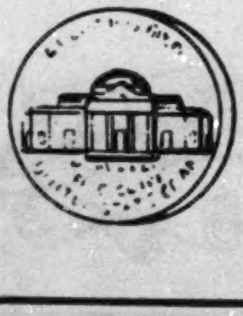

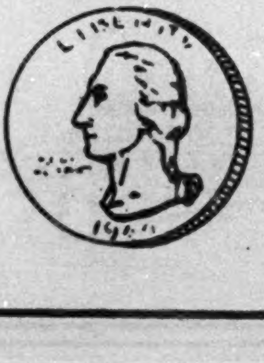
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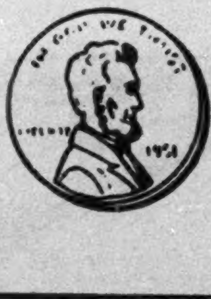

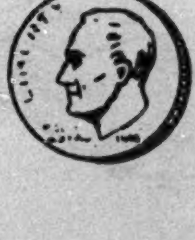

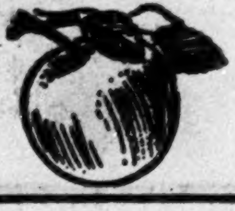

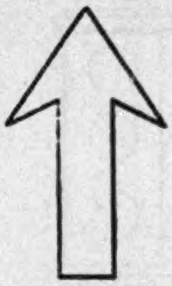
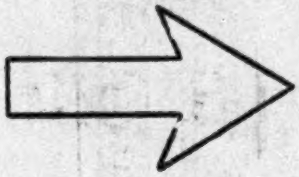
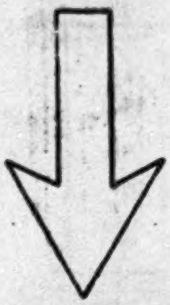
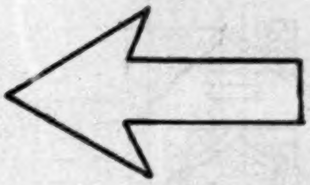

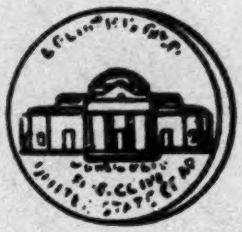
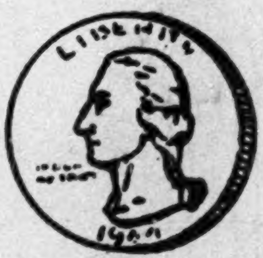
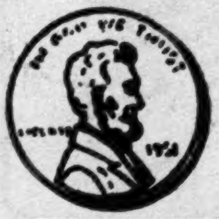
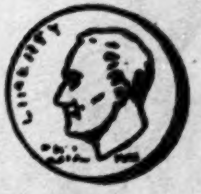

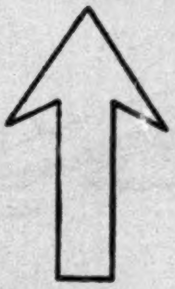
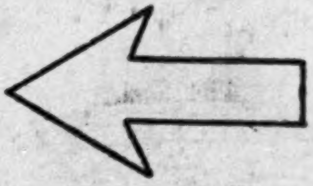
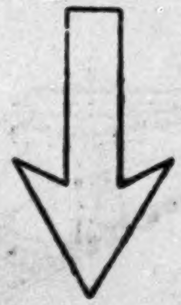
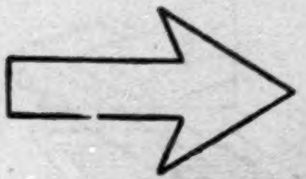

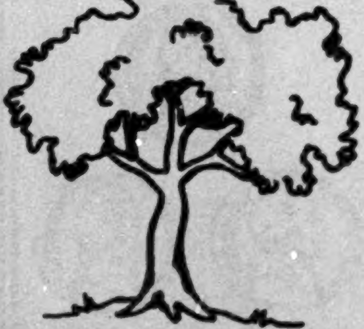
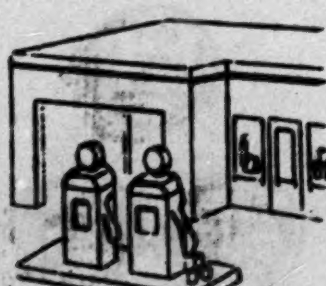
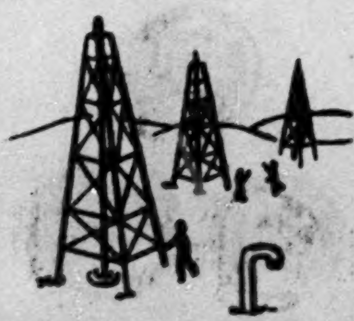
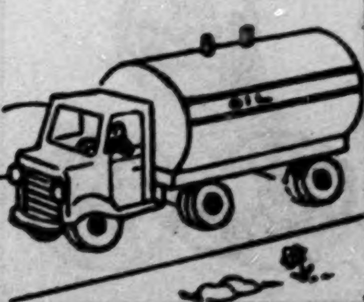

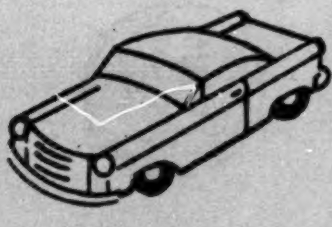
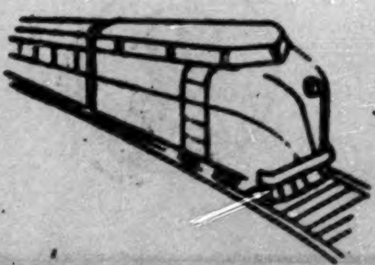
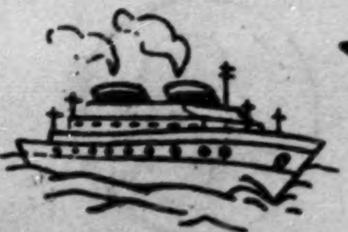
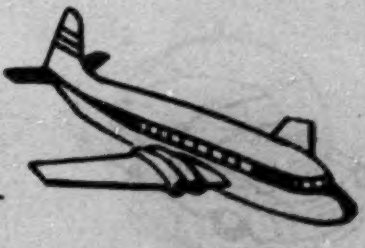

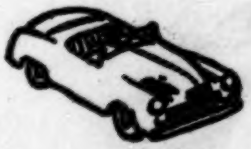

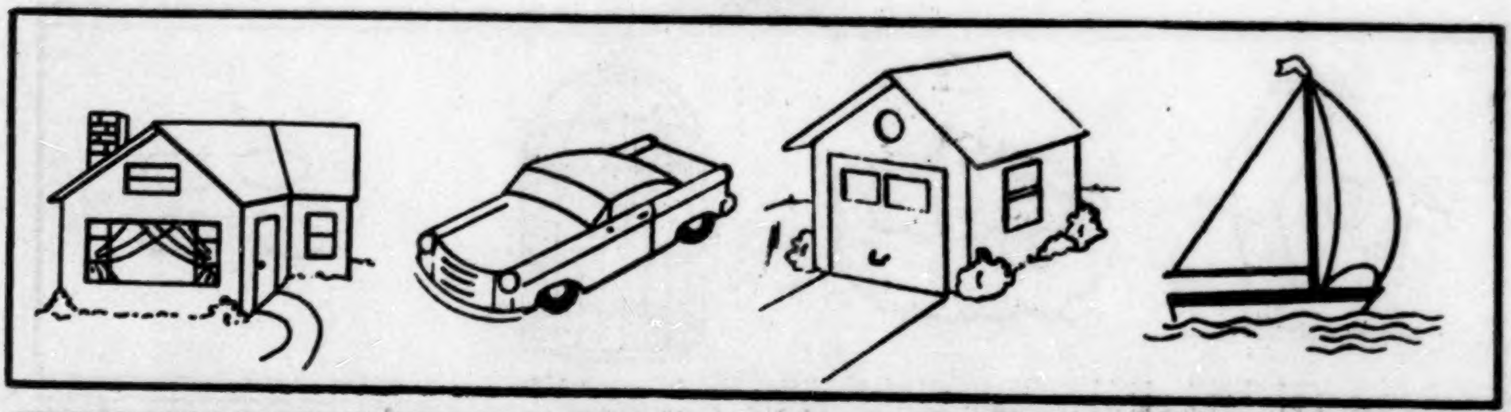

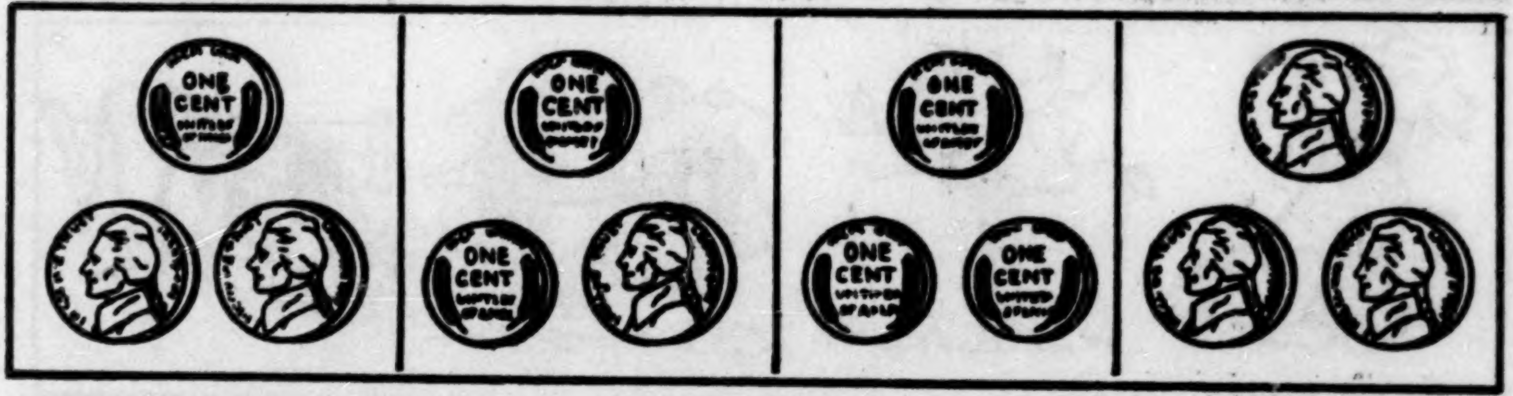
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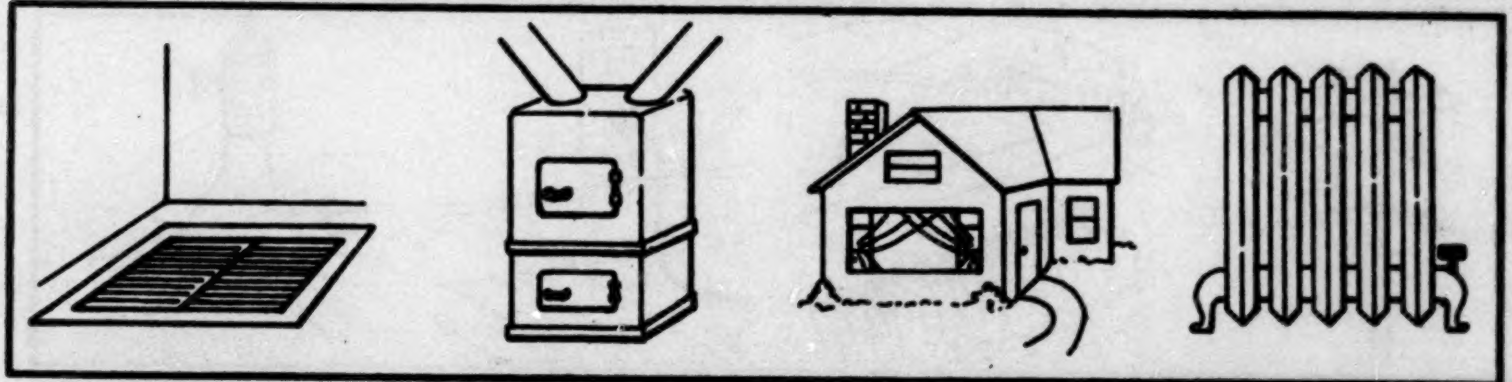

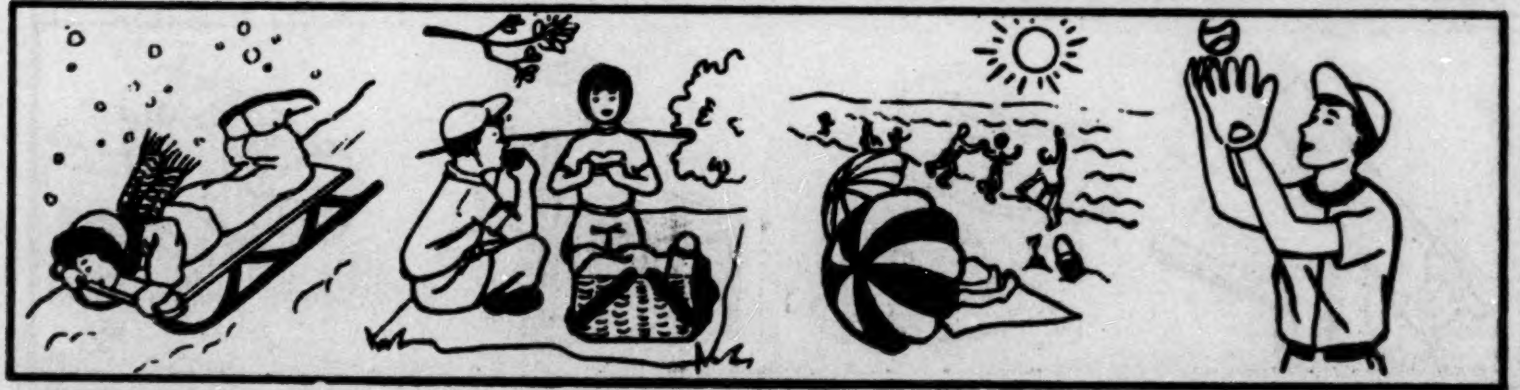

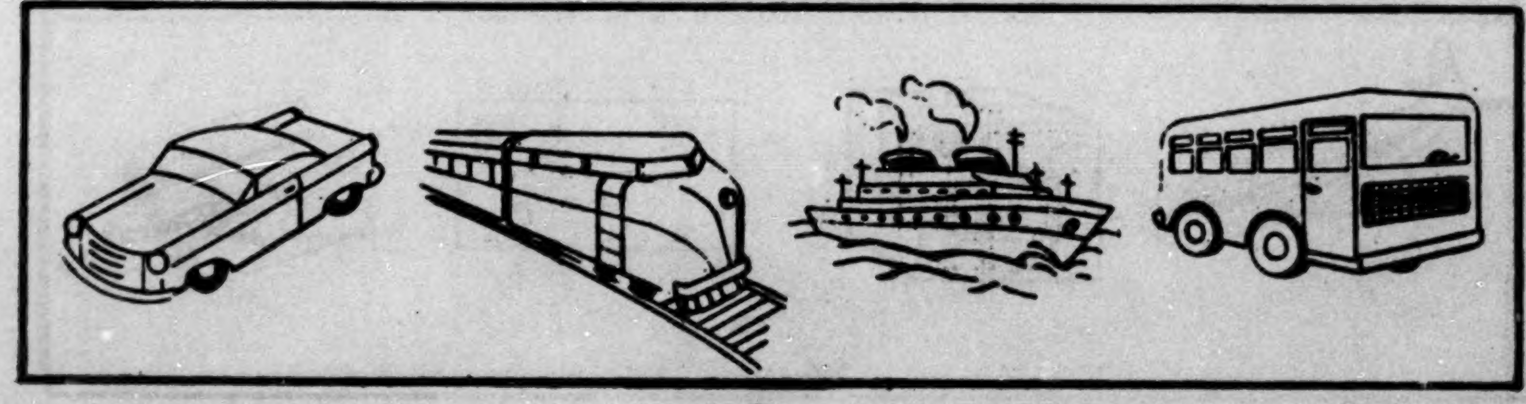

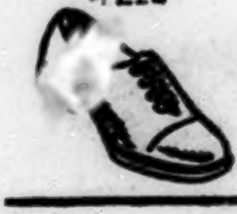

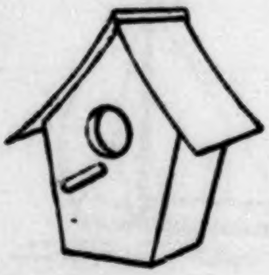

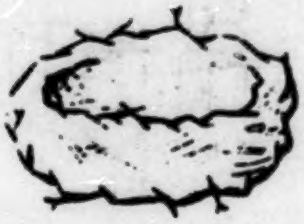

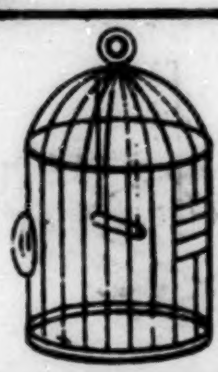

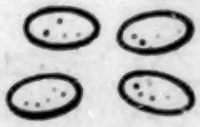

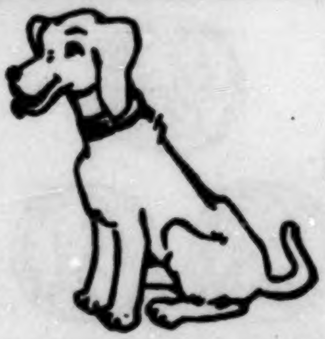

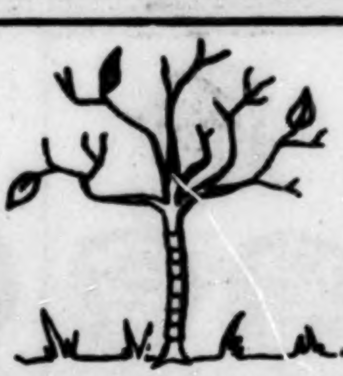

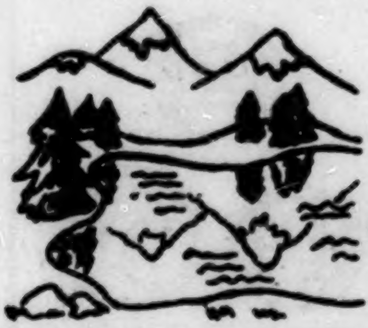

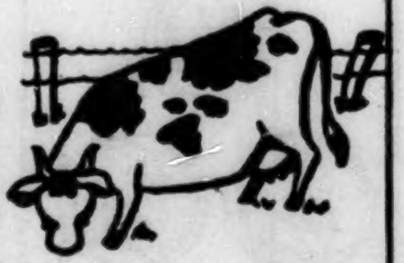

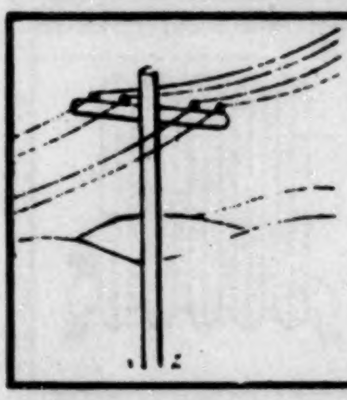

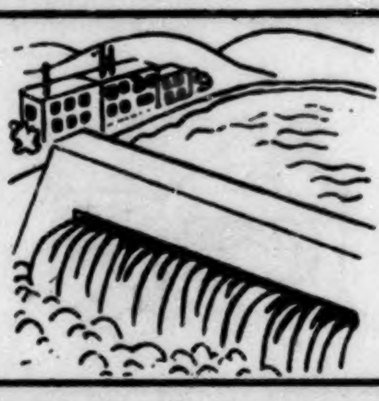

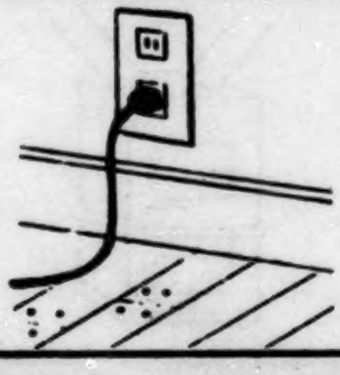

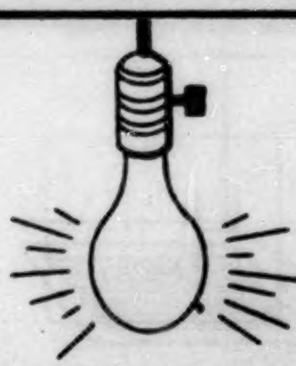

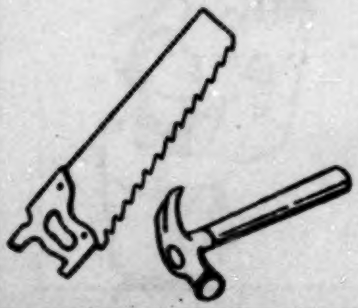

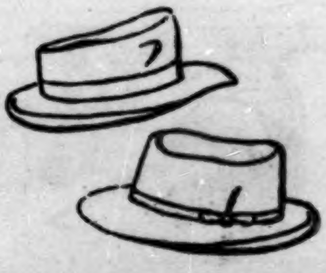

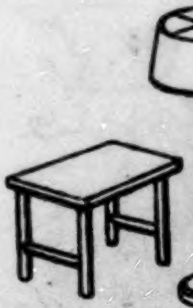

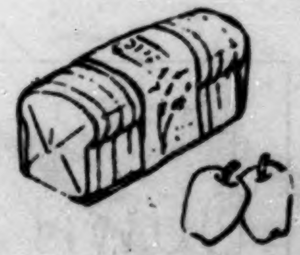

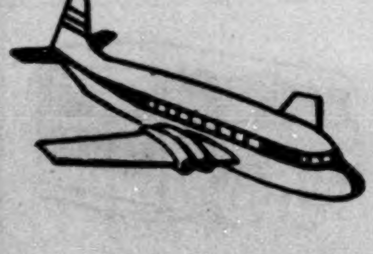

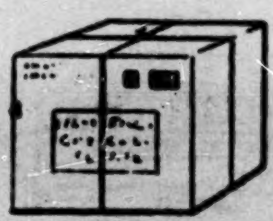

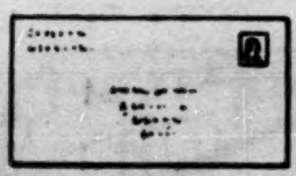

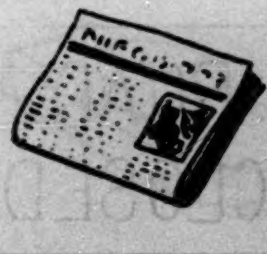

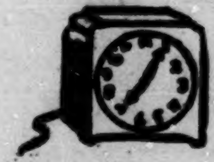

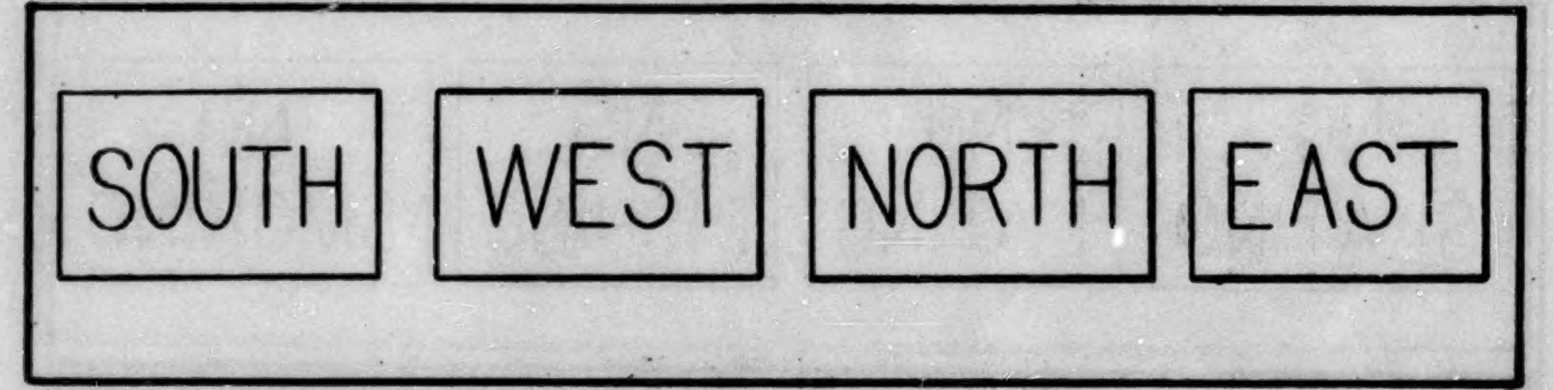
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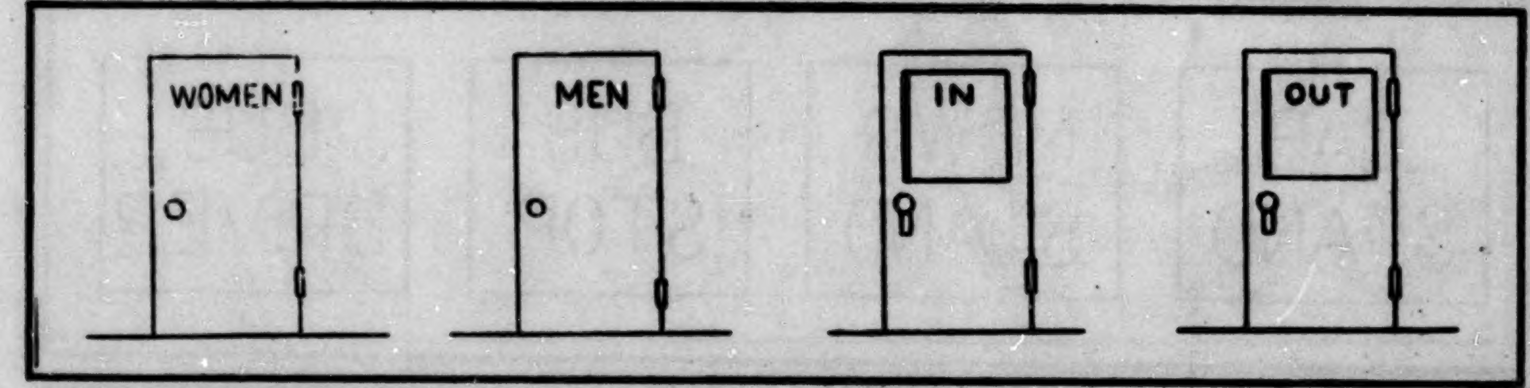
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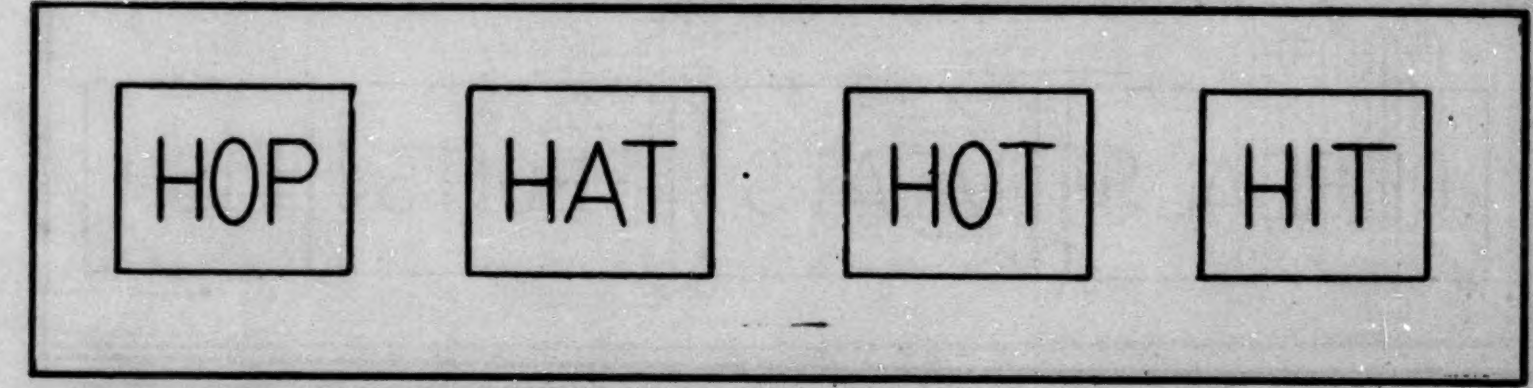
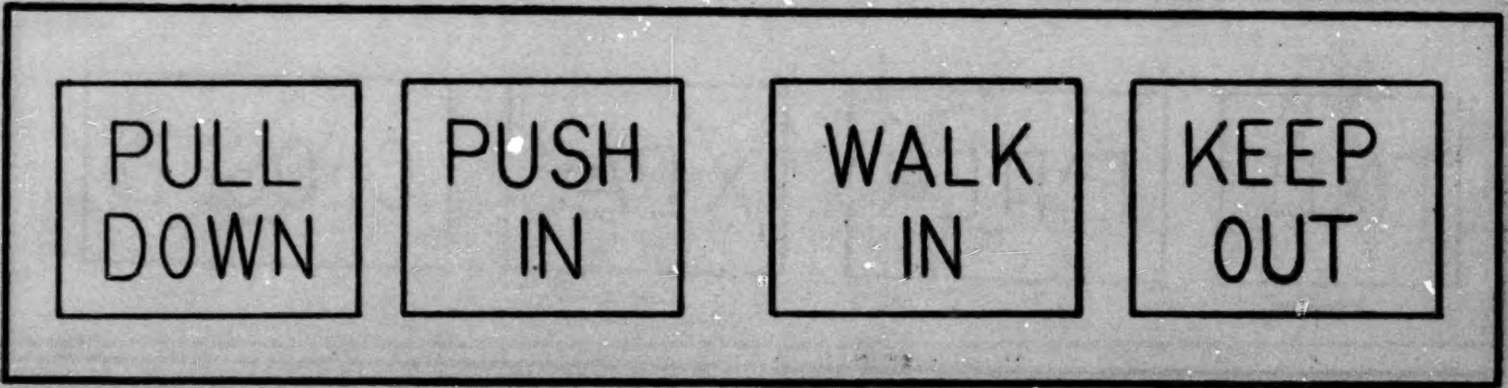
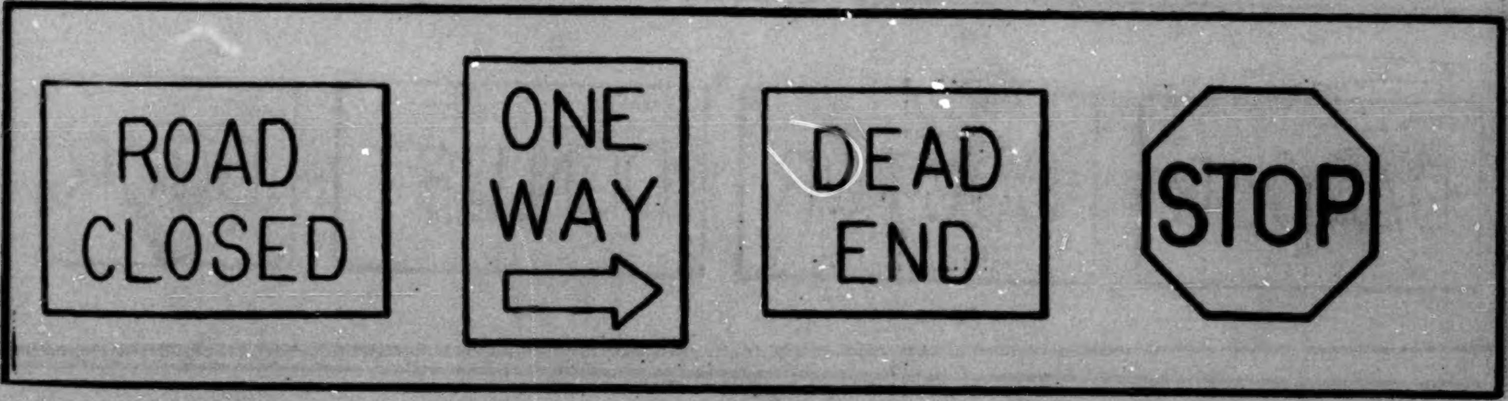
IN
OUT


HOP
HAT
HOT
HIT


PULL DOWN
PUSH IN
WALK IN
KEEP OUT


ROAD CLOSED
ONE WAY
DEAD END
STOP

NO SKATING
NO EATING
NO FISHING
NO SMOKING

CAB STAND
NEWS STAND
BUS STOP
BUS DRIVER

CEREALS
MEATS
FRUITS
FISH

EXIT
ENTER
X-RAY
CLOSED

DANGER
DOCTOR
DENTIST
DOOR

APPENDIX F

The Neighborhood Sociometric[1]

This appendix reports an investigation of the neighborhood participation of the control and experimental children as compared with children of normal intelligence. Basic to experimental investigations is control of the research situation wherever appropriate and possible. While the true pattern of out-of-school interaction of young children may include backyard crossing, corner-turning, and contact with children living beyond major traffic intersections, to study interaction effectively in a manner allowing for comparisons between groups the interaction sector must be taken into account in the research design. While proximity is a major factor, other factors also determine friendship patterns. However, to study interaction under uniform conditions with the children under investigation, interactors were selected with proximity of residence as the prime requisite.

Interaction Sector

The interaction sector was defined as the area surrounding the subject's home, bounded by the two corners of the street block named in the subject's address. For example, if a child lived at 1327 Elm Street (Elm Street being between avenues L and M), then the house on the corner of Elm and Avenue L is one boundary, and the house on the corner of Elm and Avenue M is the other. In cases where these boundaries did not include five interactors (as in almost 40 percent of the cases), the boundaries were extended to include one hundred house numbers on either side of the subject. For example, if a child lived at 1327 Elm Street, then the extended boundaries of his interaction sector were 1227 to 1427 Elm Street. The extended boundaries were subject to the limitation that no major traffic intersection be crossed.

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[1] Prepared by Dr. Joseph H. Meyerowitz while a member of project staff.

Interactors

As the complexities of this investigation could be foreseen, only the 90 urban-industrial subjects were considered for use in this segment. The criterion for selection of subjects was the availability of five other acceptable interactors within the subject's interaction sector. An acceptable interactor was a child of appropriate age for grades within the school of the subject. Where more than five children were available to be interactors, selection was made to match the subject's sex.

Of the 90 possible subjects (30 experimental mentally retarded, 30 control mentally retarded, and 30 normal), 33 met the criterion stated above and were used as subjects (10 experimental mentally retarded, 12 control mentally retarded, and 11 normal).

Thus, an interaction sector for any subject included six children, one of whom was the subject and all of whom were considered interactors with each other. With the aid of a Kankakee city map and the enrollment records of the relevant public schools, subjects and interactors were selected.

The Investigation

The 33 subjects and 125 other interactors were individually interviewed in school hours by an investigator with whom they were unfamiliar. The answers were recorded by the interviewer, and there was no evidence that any of the subjects were aware of the purpose of the questions. The interview followed the format as in Table F-1.

Table F-1

Interview Questions

1. Your name is ______________. Where do you live?
2. Who are all of the children who live near you and are about your age?
    a. Are there any others?
    b. How about in your grade? (A grade higher or lower)
    c. Do you know anyone by the name ___________? (Last name of any interactor who was not previously mentioned).
3. After school and on weekends, with which of these children do you play?
4. a. Are there any children with whom you do not like to play?
    b. If you had a party is there anyone whom you would not wish to invite?
5. I'm going to tell you about some children whom I think you know; you tell me the child's name.
    a. This child is dumb and can't play games right.
    b. This child has trouble learning things.
    c. This child is different from other children.
    d. Other children do not like to play with this child.

Previous attempts to conduct an investigation of this nature were frustrated by the high mobility of the population. Question 1 served to verify the accuracy of the school records. Question 2 measured the saliency (i.e., ease by which subject is brought to mind) of the other children to the respondent in the interaction sector. In Question 2a, each spontaneous mention of a child was ranked in order of mention. Children within the interaction sector were assigned that number equal to the rank order of mention. Observing that few respondents spontaneously listed more than seven other children, the rank of seven was the highest assigned (lowest value) to any spontaneous recall of another child in the interaction sector. Those interactors elicited in Question 2b were given the rank of eight. Those children who could only be brought to mind by mention of the last name (Question 2c) were ranked 10. If the respondent claimed no knowledge of another interactor, that interactor was ranked 20.

Questions 3 through 5 elicited acceptance and rejection patterns. If the interactor was mentioned in response to any of these questions, he achieved one point, otherwise none.

The limiting criteria established for the six interactors were children (a) of similar age, (b) of similar grade placement, and (c) living within the defined proximity of each other. The extent or nature of interaction among subjects has been ascertained. At no point was the total interaction of any one child ever the concern of this investigation. Table F-2 is a display of results. Each section has two lines: the first line lists the subject's responses about the other interactors; the second line lists the interactor responses about the subject.

Table F-2

Results of the Neighborhood Sociometric Analysis

	Retarded Control	Retarded Experimental	Normal	Range
Section One: Rank order of mention				
1. S O	11.96	16.14	15.69	1-20[a]
2. O S	12.22	12.73	16.09	
Section Two: Chosen				
3. S O	.22	.07	.50	0-1[b]
4. O S	.27	.21	.41	
Section Three: Rejected				
5. S O	.02	0	.09	0-1[c]
6. O S	.02	0	.22	
Section Four: Derogated				
7. S O	.09	.03	.09	0-1[c]
8. O S	.11	.10	.19	
Number of Subjects (Total 33)	12	10	11	
Other Interactors (Total 25)				

NOTE.--S O = Subject's responses about the other interactors.
O S = Other interactor's responses about the subjects.

[a] The lower number indicates greater saliency.
[b] The higher number indicates more choices.
[c] The lower number means less rejection and derogation.

Section One deals with responses to Question 2 (who do you know). Line 1 presents the mean recall ranking by the subject of the other interactors.

It may be noted that the other interactors for the retarded children in the control group had greater saliency as contrasted with the normal and the experimental group. For the latter, the other interactors had lower saliency.

Line 2 presents the mean recall rank of the subject's interactors. It may be seen that retarded children, whether in regular or special classes, are equally well-known and their saliency is higher than that of the normal group.

Section Two deals with the responses to Question 3 (with whom do you play). Line 3 presents the subject's report of playing with the five interactors. It may be seen that the normal subjects reported playing less than one-fourth the time with their interactors, and in the retarded experimental group, less than one-tenth. Line 4 represents the interactors report on playing with the subject. It may be seen that they reported that they spent less than one-half the time playing with the normal subject, and spent about equal time (one-fourth) playing with either retarded group.

Section Three deals with responses to Question 4 (with whom do you not play). Line 5 presents the rejection by the subject of the interactors. Line 6 presents the rejection by the interactor, of the subject. It may be seen that there is a little rejection expressed by any of these children.

Section Four deals with responses to Question 5 (who is this unacceptable child). Line 7 represents the derogation of interactors by the subject. It may be seen that the retarded control and the normal group both received three times as much derogation by others than did the retarded experimental subjects. Line 8 presents the derogation of the subject by the interactors. It may be seen that the normal subjects receive twice the derogation ascribed to the retarded groups.

The retarded control subjects seemed to make a greater effort to know the interactors within their sector than did the other subjects. However, their effort was not rewarded by their being better known than the retarded experimental subjects. It appeared that the other children in the neighborhood of the retarded child remembered him more than they did normal peers, whether he was designated as retarded by the school and placed in a special class or not. The effect of the special class seemed to be to reduce the extent to which the retarded child attempted to interact with age peers in the neighborhood.

The normal subjects reported playing with about half of the interactors and their report was confirmed by the interactors. (The small apparent discrepancies were explainable in terms of some halo effects in the subjects' reports.) The interactors reported only half as much play with the retarded subjects as with the normal subjects, but equal amounts among the retarded, regardless of the experimental variables. The retarded in the experimental group reported less choice interaction than did the retarded control subjects. The effect of the special class seemed to be the reduction of perception of interaction.

Conclusions

The data do not support the assumption that the rejection and isolation of the retarded child in school is carried over into out-of-school activities. The lower rejection of the retarded subjects as compared to normal subjects may be attributed to less interaction. However, if this interpretation is accepted, then the activities of rejecting and being rejected, however slight, manifested by the retarded control group, must be attributed to tensions originating in the school. Further support for this interpretation is found on the relatively high number of derogations described by the retarded control group to the interactors.

The overall view is that of the retarded child being known and discounted without regard to special-class placement. It may be argued that the energies expended by the retarded control group to know the interactors and to report interaction, rejection, and derogation are unrealistic, inasmuch as they are known, played with, and not rejected or derogated to any greater degree than the retarded experimental group. This may be viewed as an inappropriate response to the situation by the retarded control group and may be considered as a negative reaction. However, it may be equally argued that the retarded experimental group were reacting to their situation by cutting themselves off from their age peers. This was certainly not the aim of the proponents of special education for the retarded child. The results of this section of the investigation tend to dispute in-school findings and, in view of this, they could not be used to support the contention of improved social relationships for the special class retarded child.

APPENDIX G

Success Approaching and Failure Avoiding Tests: Probability Learning and Task Motivation[1]

Two tests were administered to determine differences between the experimental and control children in probability learning and motivation in performing a simple task (marble dropping). The first test permitted observation of learning behavior in a relatively impersonal probability learning situation. The second test indicated the response of the child to encouragement by the experimenter.

Probability Learning

In the probability learning situation, the children were presented with an apparatus featuring three large black knobs in a horizontal row, a red "ready light," a marble-dispensing aperature, and a collection box. The child was told that he would receive a marble every time he pressed the correct knob and that he would win a prize; then he was told to select the prize that he would like to try to win. The operation of the apparatus was demonstrated to show the child that pressing the correct know would, in fact, produce a marble while pressing an incorrect knob would not. Each child was given 100 test trials. The apparatus was set to provide a 50 percent contingent reinforcement to a single predetermined knob with two additional knobs never delivering a reinforcement. The reinforcement schedule was randomized and predetermined for each subject. Ten different reinforcement schedules were used so that each child did not receive and same schedule.

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[1] Study conducted by Hans Hahn and Dr. James Moss.

Previous research with this procedure (Stevenson & Zigler, 1958) has demonstrated rather consistently that normal children reach an asymptote of response on the reinforcing knob at roughly the percent of reinforcement while mentally retarded children typically asymptote at a significantly higher level. This same conclusion was reached by Shipe (1960) in a study of probability learning. Presumably, normal children see the rather minimal payoff as unsatisfactory and continue to explore the other knobs in an attempt to improve their performance; they are "success seekers." The retardates, more satisfied with minimum rewards, are content to concentrate on the one knob which they recognize as paying off, even if it is only on a minimal basis.

The findings of the probability learning aspect of this study are presented in Table G-1 and in Figures G-1, G-2, and G-3. These data show the special class low-IQ children reaching an asymptote at approximately the predicted level while their regular class counterparts reach an asymptote at a level significantly higher than the expected level. The average number of responses to the reinforcing knob was about the same for both experimental and control children for the first twenty-trial block with both groups quickly identifying the reinforcing knob. The low-IQ control group made consistent increases in its responses to the reinforcing knob, finally reaching 71 percent. The low-IQ experimental children never exceeded 58 percent responses to the reinforcing knob and ended with a little better than 55 percent. There were no significant differences between the experimental and control high-IQ groups, nor were any significant differences apparent when the groups were analyzed as total

Table G-1

Mean Percentage of Responses to Reinforcing Knob for Experimental and Control Subjects by Combined and IQ Groups (Five Blocks of Twenty Trials Each)

Groups	1	2	3	4	5
Combined					
Experimental (N=40)	51.8	56.2	60.2	59.5	60.2
Control (N=52)	46.2	55.2	59.0	60.6	62.5
High-IQ Groups					
Experimental (N=22)	52.2	56.4	64.8	61.2	64.3
Control (N=35)	44.8	54.0	56.8	58.8	58.0
Low-IQ Groups					
Experimental (N=18)	51.1	56.1	54.7	57.5	55.2
Control (N=17)	48.8	57.6	63.2	64.1	71.8

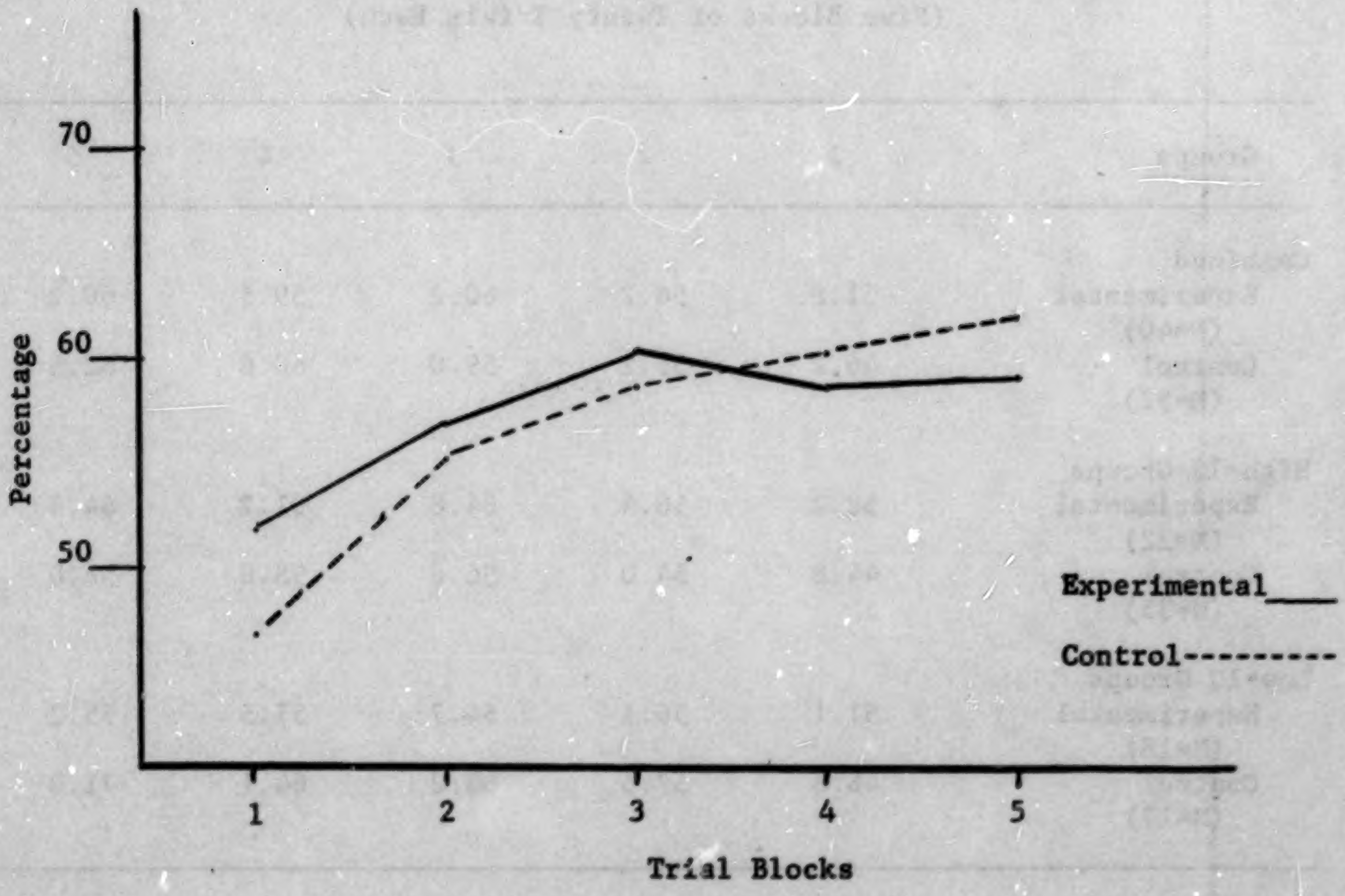

Figure G-1

Percentage of responses to reinforcing knob by trial blocks for experimental and control children (total groups)

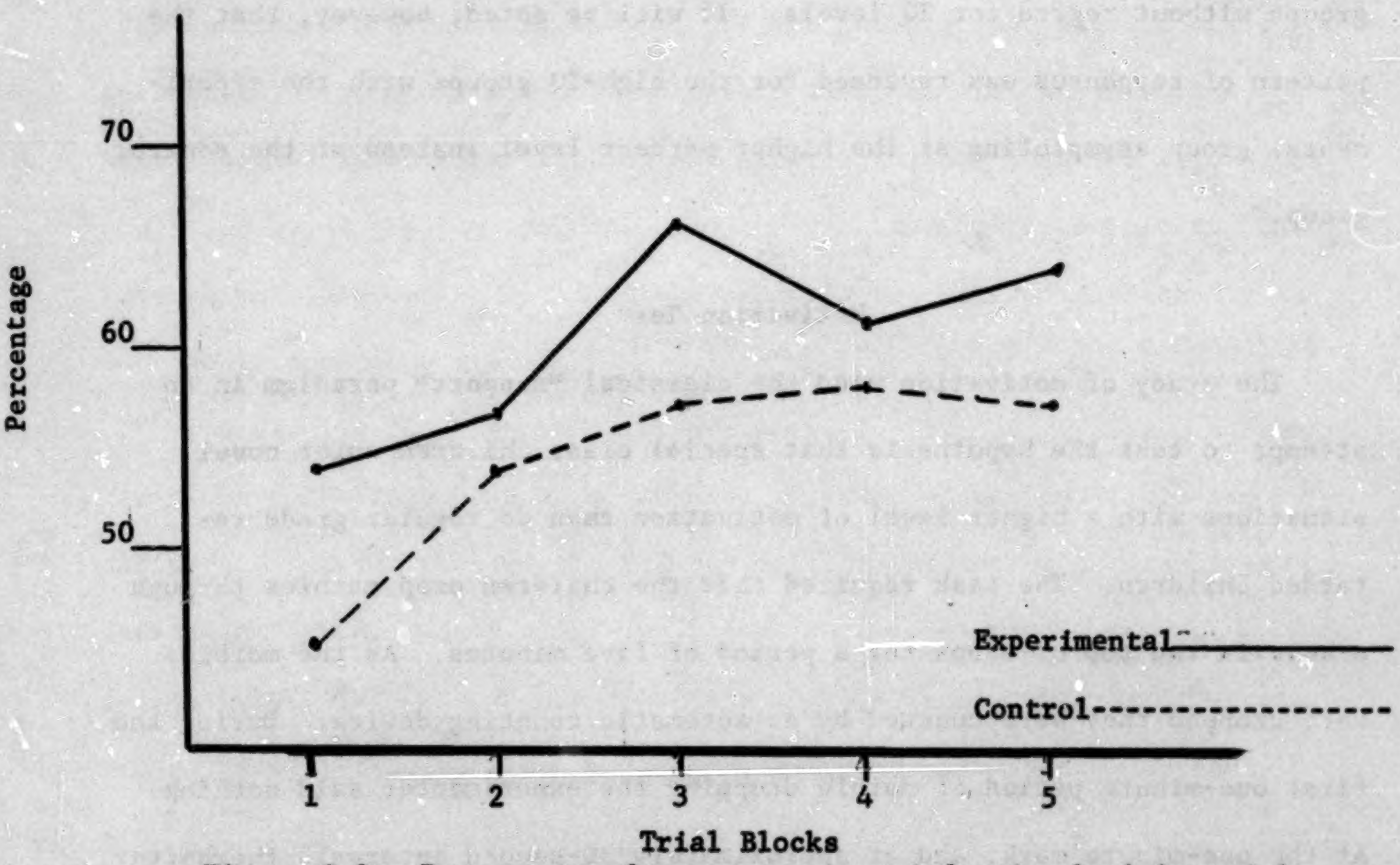

Figure G-2. Percentage of responses to reinforcing knob by trial blocks for experimental and control children (high-IQ groups)

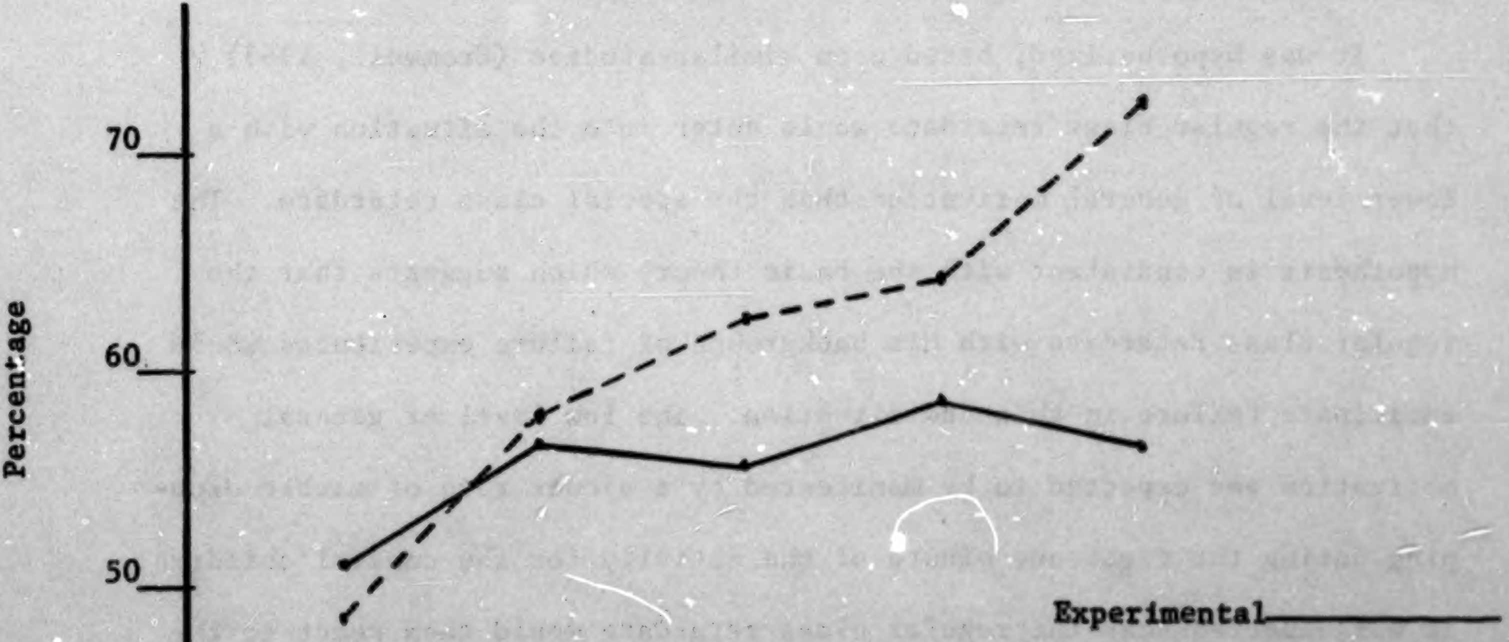

Figure G-3. Percentage of responses to reinforcing knob by trial blocks for experimental and control children (low-IQ groups)

groups without regard for IQ levels. It will be noted, however, that the pattern of responses was reversed for the high-IQ groups with the experimental group asymptoting at the higher percent level instead of the control group.

Motivation Test

The study of motivation used the classical "support" paradigm in an attempt to test the hypothesis that special class children enter novel situations with a higher level of motivation than do regular grade retarded children. The task required that the children drop marbles through a hole in the top of a box for a period of five minutes. As the marbles were dropped they were counted by an automatic counting device. During the first one-minute period of marble dropping the experimenter said nothing. At the one-minute mark, and at approximately 30-second intervals thereafter, the examiner remarked on how well the subject was doing in the task.

It was hypothesized, based upon similar studies (Cromwell, 1963), that the regular class retardate would enter into the situation with a lower level of general motivation than the special class retardate. The hypothesis is consistent with the basic theory which suggests that the regular class retardate with his background of failure experiences would anticipate failure in this new situation. The low level of general motivation was expected to be manifested by a slower rate of marble dropping during the first one minute of the activity for the control children. It was expected that the regular class retardate would then react to the positive reinforcement with a positive change in his attitude toward the task and therefore increase the rate of his output. The special class retardate was assumed to enter the marble task, as with any new task, with a higher level of motivation and, therefore, his level of motivation would not be as greatly influenced by the behavior of the examiner. The rate of marble dropping would not be expected to change significantly for the latter group.

The results of this study are presented in Table G-2. The mean number of marbles dropped in each one-minute period shows very little difference between the two groups with most of the increment occurring during the second minute. No significant differences in increment scores were noted between the high- and low-IQ experimental and control group. The p-value obtained for the total group was between .20 and .10.

Table G-2

Mean Number of Marbles Dropped per Minute and Standard Deviations for Experimental and Control Children by Total Groups and IQ Subgroups

Groups	Periods of One Minute Each 1	2	3	4	5
Total Groups					
Experimental (N=40)					
Mean	30.95	32.02	32.25	32.45	31.82
S.D.	5.34	5.98	5.56	6.67	5.81
Control (N=52)					
Mean	29.23	31.23	31.25	31.06	31.13
S.D.	5.45	5.69	5.26	5.77	5.08
High-IQ Groups					
Experimental (N=22)					
Mean	31.59	33.18	32.55	32.73	32.55
S.D.	5.57	6.02	5.54	7.06	5.91
Control (N=35)					
Mean	30.23	32.51	32.34	32.54	32.31
S.D.	5.26	5.19	4.24	4.47	3.95
Low-IQ Groups					
Experimental (N=18)					
Mean	30.17	30.61	31.89	32.11	30.94
S.D.	5.09	5.77	5.73	6.35	5.73
Control (N=17)					
Mean	27.18	28.59	29.00	28.00	28.71
S.D.	5.40	5.92	6.49	6.98	6.30

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